Đã bắt đầu vào lúc	Thứ tư, 12 Tháng mười 2022, 10:58 PM
Tình trạng	Đã hoàn thành
Hoàn thành vào lúc	Thứ tư, 12 Tháng mười 2022, 11:01 PM
Thời gian thực hiện	2 phút 57 giây
Điểm	11,00/11,00
Điểm	10,00 của 10,00 (100 %)



Câu hỏi 1

Chính xác

Điểm 1,00 của 1,00

Implement methods **add**, **size** in template class **SLinkedList** (**which implements List ADT**) representing the singly linked list with type T with the initialized frame. The description of each method is given in the code.

```
template <class T>
class SLinkedList {
public:
    class Node; // Forward declaration
protected:
   Node* head;
   Node* tail;
   int count;
public:
    SLinkedList();
    ~SLinkedList();
    void
           add(T e);
    void
           add(int index, T e);
    int
public:
    class Node {
    private:
       T data;
       Node* next;
        friend class SLinkedList<T>;
   public:
       Node() {
           next = 0;
        }
       Node(Node* next) {
           this->next = next;
        Node(T data, Node* next) {
           this->data = data;
           this->next = next;
                                                   BổI HCMUT-CNCP
        }
    };
```

For example:

Test	Result
<pre>SLinkedList<int> list; int size = 10;</int></pre>	[0,1,2,3,4,5,6,7,8,9]
<pre>for(int index = 0; index < size; index++){ list.add(index); }</pre>	
<pre>cout << list.toString();</pre>	
<pre>SLinkedList<int> list; int size = 10;</int></pre>	[9,8,7,6,5,4,3,2,1,0]
<pre>for(int index = 0; index < size; index++){ list.add(0, index); }</pre>	
<pre>cout << list.toString();</pre>	

Answer: (penalty regime: 0, 0, 0, 5, 10, 15, ... %)

```
template <class T>
    void SLinkedList<T>::add(const T& e) {
 2
        /* Insert an element into the end of the list. */
 3
        Node* newNode = new Node(e,nullptr);
 4
 5
        if(count == 0){
 6
            head = tail = newNode;
 7
            count++;
 8
            return;
 9
        }
10
        tail->next = newNode;
11
        tail = newNode;
12
        count++;
13
14
15
    template<class T>
16
    void SLinkedList<T>::add(int index, const T& e) {
17
        /* Insert an element into the list at given index. */
18
        Node* newNode = new Node(e,nullptr);
        if(count == 0){
19
            head = tail = newNode;
20
21
            count++;
22
            return;
23
        Node* tmp = head;
24
        if(index == 0){
25
26
            newNode->next = head;
27
            head = newNode;
28
            count++;
29
            return;
30
        if(index == count){
31
32
            tail->next = newNode;
33
            tail = newNode;
34
            count++;
35
            return;
36
37
        for(int i =1; i< index; i++) tmp = tmp->next;
38
        newNode->next = tmp->next;
39
        tmp->next = newNode;
        count++;
40
                                            BÓI HCMUT-CNCP
41
42
    template<class T>
43
44
    int SLinkedList<T>::size() {
45
        /* Return the length (size) of list */
        return count;
46
47
    }
48
```

	Test	Expected	Got	
~	<pre>SLinkedList<int> list; int size = 10; for(int index = 0; index < size; index++){ list.add(index); }</int></pre>	[0,1,2,3,4,5,6,7,8,9]	[0,1,2,3,4,5,6,7,8,9]	~
	<pre>cout << list.toString();</pre>			

Passed all tests! ✓

Chính xác



Câu hỏi 2 Chính xác Điểm 1,00 của 1,00

Implement methods **get**, **set**, **empty**, **indexOf**, **contains** in template class **SLinkedList** (**which implements List ADT**) representing the singly linked list with type T with the initialized frame. The description of each method is given in the code.

```
template <class T>
class SLinkedList {
public:
   class Node; // Forward declaration
protected:
   Node* head;
   Node* tail;
   int count;
public:
   SLinkedList(): head(NULL), tail(NULL), count(0);
   ~SLinkedList() { };
           add(T e);
   void
   void
           add(int index, T e);
   int
           size();
   bool
           empty();
           get(int index);
   void
           set(int index, T e);
   int
           indexOf(T item);
   bool
           contains(T item);
public:
   class Node {
   private:
       T data;
       Node* next;
       friend class SLinkedList<T>;
   public:
       Node() {
           next = 0;
                                      TÀI LIỆU SƯU TẬP
       Node(Node* next) {
                                                BổI HCMUT-CNCP
           this->next = next;
       Node(T data, Node* next = NULL) {
           this->data = data;
           this->next = next;
       }
   };
};
```

For example:

```
Test
                                                     Result
SLinkedList<int> list;
                                                     [8,15,2,4,7,10,40,6]
int values[] = {10, 15, 2, 6, 4, 7, 40,
                                               8};
int index[]
             = {0, 0, 1, 3, 2, 3, 5,
                                               0);
int expvalues[]= {8, 15, 2, 4, 7, 10, 40, 6};
for (int idx = 0; idx < 8; idx++){
   list.add(index[idx], values[idx]);
assert( list.size() == 8 );
for (int idx = 0; idx < 8; idx++){
   assert( list.get(idx) == expvalues[idx] );
cout << list.toString();</pre>
SLinkedList<int> list;
                                                     []
assert( list.empty() == true );
cout << list.toString();</pre>
```

Answer: (penalty regime: 0, 0, 0, 5, 10, 15, ... %)

```
Reset answer
```

```
template<class T>
 2
    T SLinkedList<T>::get(int index) {
        if(index >= count || index < 0) throw std::out_of_range("hi");</pre>
 3
        /* Give the data of the element at given index in the list.
 4
 5
        Node* tmp = head;
 6
        for(int i=1; i<= index;i++) tmp = tmp->next;
 7
        return tmp->data;
 8
 9
10
11
    template <class T>
12
    void SLinkedList<T>:::set(int index, const T& e)
        /* Assign new value for element at given index in the list */
13
        if(index >= count || index < 0) throw std::out_of_range("hi");</pre>
14
15
        Node* tmp = head;
        for(int i = 1; i<=index;i++) tmp = tmp->next;
16
17
        tmp->data = e;
18
19
20
    template<class T>
21
    bool SLinkedList<T>::empty() {
22
        /* Check if the list is empty or not. */
23
        if(count) return false;
24
        return true;
25
26
27
    template<class T>
    int SLinkedList<T>::indexOf(const T& item) {
28
        /* Return the first index wheter item appears in list, otherwise return -1 */
29
        Node* tmp = head;
30
31
        int index = 0;
        while(tmp != nullptr){
32
33
            if(tmp->data == item) return index;
34
            tmp = tmp->next;
35
            index++;
36
37
        return -1;
38
39
40
    template<class T>
    bool SLinkedList<T>:::contains(const T& item) {
41
        /* Check if item appears in the list */
42
```

```
43
        Node* tmp = nead;
44 🔻
        while(tmp != nullptr){
45
            if(tmp->data == item) return true;
46
            tmp = tmp->next;
47
48
        return false;
49 }
```

	Test	Expected	Got	
~	<pre>SLinkedList<int> list; int values[] = {10, 15, 2, 6, 4, 7, 40, 8}; int index[] = {0, 0, 1, 3, 2, 3, 5, 0}; int expvalues[] = {8, 15, 2, 4, 7, 10, 40, 6}; for (int idx = 0; idx < 8; idx++){ list.add(index[idx], values[idx]); } assert(list.size() == 8); for (int idx = 0; idx < 8; idx++){ assert(list.get(idx) == expvalues[idx]);</int></pre>	[8,15,2,4,7,10,40,6] OAC	[8,15,2,4,7,10,40,6]	~
	cout << list.toString();	ุ้บ รูบับ	TẬP	
~	SLinkedList <int> list;</int>	HCMUT-CNCP	[]	~
	<pre>assert(list.empty() == true); cout << list.toString();</pre>			

Passed all tests! 🗸

Chính xác

Câu hỏi 3 Chính xác Điểm 1,00 của 1,00

Implement methods **removeAt**, **removeItem**, **clear** in template class **SLinkedList** (**which implements List ADT**) representing the singly linked list with type T with the initialized frame. The description of each method is given in the code.

```
template <class T>
class SLinkedList {
public:
    class Node; // Forward declaration
protected:
    Node* head;
    Node* tail;
    int count;
public:
    SLinkedList();
    ~SLinkedList();
            add(T e);
    void
    void
            add(int index, T e);
    int
            size();
    bool
            empty();
    int
            size();
    void
            clear();
            get(int index);
   void
            set(int index, T e);
            indexOf(T item);
    int
   bool
           contains(T item);
    Т
            removeAt(int index);
    bool
            removeItem(T item);
public:
    class Node {
    private:
        T data;
       Node* next;
        friend class SLinkedList<T>;
    public:
                                                    BổI HCMUT-CNCP
        Node() {
            next = 0;
        }
        Node(Node* next) {
            this->next = next;
        }
        Node(T data, Node* next = NULL) {
            this->data = data;
            this->next = next;
        }
    };
};
```

For example:

Test	Result
SLinkedList <int> list;</int>	[1,2,3,4,5,6,7,8,9]
<pre>for (int i = 0; i < 10; ++i) { list.add(i); } assert(list.get(0) == list.removeAt(0));</pre>	
<pre>cout << list.toString();</pre>	

Test	Result
SLinkedList <int> list;</int>	[0,1,2,3,4,5,6,7,8]
for (int i = 0; i < 10; ++i) { list.add(i);	
<pre>} assert(list.get(9) == list.removeAt(9));</pre>	
<pre>cout << list.toString();</pre>	
SLinkedList <int> list;</int>	[0,1,2,3,4,5,6,7,8]
for (int i = 0; i < 10; ++i) { list.add(i);	
<pre>} assert(list.removeItem(9));</pre>	
<pre>cout << list.toString();</pre>	

Answer: (penalty regime: 0, 0, 0, 5, 10, 15, ... %)

```
template <class T>
 2
    T SLinkedList<T>::removeAt(int index)
 3 ,
    {
        /* Remove element at index and return removed value */
 4
        if(index >= count || index < 0) throw std::out_of_range("hi");</pre>
 5
 6
        if(count == 1){
 7
            T value = head->data;
 8
            delete head;
            head = tail = nullptr;
 9
10
            count--;
            return value;
11
12
13
        if(index == 0){
            Node* tmp = head;
14
            T value = head->data;
15
            head = head->next;
16
17
            delete tmp;
                                            BÓI HCMUT-CNCP
18
            count--;
19
            return value;
20
21
        Node* tmp = head;
22
        for(int i =1; i< index;i++) tmp = tmp->next;
23
        if(index == count -1) tail = tmp;
24
        Node* tmp2 = tmp->next;
25
        T value = tmp->next->data;
        tmp->next = tmp->next->next;
26
27
        delete tmp2;
28
        count--;
29
        return value;
30
31
32
    template <class T>
33
    bool SLinkedList<T>::removeItem(const T& item)
34
    {
        /st Remove the first apperance of item in list and return true, otherwise return false st/
35
        Node* tmp = head;
36
37
        int i = 0;
38
        while(tmp!=nullptr){
            if(tmp->data == item) {
39 ,
40
                removeAt(i);
41
                return true;
42
43
            tmp = tmp->next;
44
            i++;
45
46
        return false;
```

```
48
    template<class T>
49
50
   void SLinkedList<T>::clear(){
51
        /* Remove all elements in list */
52 ▼
        while(count){
53
            removeAt(0);
54
55
56
57
```

	Test	Expected	Got	
~	SLinkedList <int> list;</int>	[1,2,3,4,5,6,7,8,9]	[1,2,3,4,5,6,7,8,9]	~
	<pre>for (int i = 0; i < 10; ++i) { list.add(i); }</pre>			
	<pre>assert(list.get(0) == list.removeAt(0)); cout << list.toString();</pre>	KHOACN	CA	
~	<pre>SLinkedList<int> list; for (int i = 0; i < 10; ++i) { list.add(i); } assert(list.get(9) == list.removeAt(9));</int></pre>	[0,1,2,3,4,5,6,7,8]	[0,1,2,3,4,5,6,7,8]	~
	<pre>cout << list.toString();</pre>			

Passed all tests! ✓

TÀI LIỆU SƯU TẬP

BỞI HCMUT-CNCP

Chính xác



Chính xác

Điểm 1,00 của 1,00

Implement Iterator class in class SLinkedList.

Note: Iterator is a concept of repetitive elements on sequence structures. Iterator is implemented in class vector, list in STL container in C++ (https://www.geeksforgeeks.org/iterators-c-stl/). Your task is to implement the simple same class with iterator in C++ STL container.

Please read example and testcase carefully.



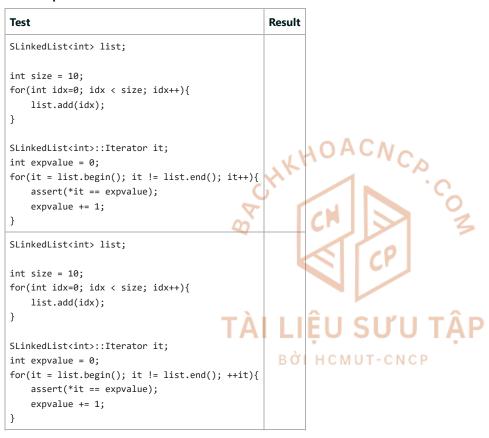
```
template <class T>
class SLinkedList
public:
    class Iterator; //forward declaration
   class Node;
                   //forward declaration
protected:
   Node *head;
   Node *tail;
   int count;
public:
   SLinkedList() : head(NULL), tail(NULL), count(0){};
   ~SLinkedList();
   void add(const T &e);
   void add(int index, const T &e);
   T removeAt(int index);
   bool removeItem(const T &removeItem);
   bool empty();
   int size();
   void clear();
   T get(int index);
   void set(int index, const T &e);
   int indexOf(const T &item);
   bool contains(const T &item);
   string toString();
   SLinkedList(const SLinkedList &list)
        this->count = 0;
       this->head = NULL;
       this->tail = NULL;
   }
   Iterator begin()
       return Iterator(this, true);
   }
   Iterator end()
        return Iterator(this, false);
    }
public:
    class Node
                                                   BổI HCMUT-CNCP
    {
   private:
       T data;
       Node *next;
       friend class SLinkedList<T>;
   public:
       Node()
        {
           next = 0;
       }
       Node(Node *next)
            this->next = next;
       }
       Node(T data, Node *next = NULL)
           this->data = data;
           this->next = next;
        }
   };
   class Iterator
   private:
       SLinkedList<T> *pList;
       Node *current;
       int index; // corresponding with current node
```

```
public:
    Iterator(SLinkedList<T> *pList, bool begin);
    Iterator & operator=(const Iterator & iterator);
    void set(const T & e);
    T & operator*();
    bool operator!=(const Iterator & iterator);

    // Prefix ++ overload
    Iterator & operator++();

    // Postfix ++ overload
    Iterator operator++(int);
};
```

For example:



Answer: (penalty regime: 0, 0, 0, 5, 10 %)

```
template <class T>
    SLinkedList<T>::Iterator::Iterator(SLinkedList<T>* pList, bool begin)
 3 ▼ {
 4
            Constructor of iterator
 5
            * Set pList to pList
 6
 7
            * begin = true:
 8
            * * Set current (index = 0) to pList's head if pList is not NULL
            * * Otherwise set to NULL (index = -1)
 9
10
            * begin = false:
11
            * * Always set current to NULL
            * * Set index to pList's size if pList is not NULL, otherwise 0
12
13
        this->pList = pList;
14
15
        if(begin){
            this->current = (pList==nullptr) ? NULL : pList->head;
16
17
            this->index = (pList==nullptr) ? -1 : 0;
18
```

```
19
        else {
20
            this->current = NULL;
21
            index = (pList==nullptr) ? 0 : pList->size();
22
23
24
25
    template <class T>
26
27
    typename SLinkedList<T>::Iterator& SLinkedList<T>::Iterator::operator=(const Iterator& iterator)
28
29
            Assignment operator
30
            * Set this current, index, plist to iterator corresponding elements.
31
32
33
        this->current = iterator.current;
34
        this->pList = iterator.pList;
        this->index = iterator.index;
35
36
        //return SLinkedList;
37
        //Iterator newI = Iterator(iterator.pList,false);
        //newI.current = iterator.current;
38
39
        //newI.index = iterator.index;
        return *this;
40
41
42
43
    template <class T>
44
    void SLinkedList<T>::Iterator::remove()
45
    {
46
            Remove a node which is pointed by current
47
            st After remove current points to the previous node of this position (or node with index - 1)
48
            * If remove at front, current points to previous "node" of head (current = NULL, index = -1)
49
            * Exception: throw std::out_of_range("Segmentation fault!") if remove when current is NULL
50
51
52
        if(current == NULL) throw std::out_of_range("Segmentation fault!");
53
        if(index == 0) {
54
            pList->removeAt(0);
55
            current = NULL;
56
            index = -1;
57
            return;
58
59
        Node* tmp = pList->head;
60
        int i = 0;
        while(tmp->next != current){
61 •
62
            tmp = tmp->next;
                                           BỞI HCMUT-CNCP
```

```
Test

✓ SLinkedList<int> list;

int size = 10;
  for(int idx=0; idx < size; idx++){
      list.add(idx);
  }

SLinkedList<int>::Iterator it;
  int expvalue = 0;
  for(it = list.begin(); it != list.end(); it++){
      assert(*it == expvalue);
      expvalue += 1;
  }
```

```
Test
SLinkedList<int> list;
int size = 10;
for(int idx=0; idx < size; idx++){</pre>
    list.add(idx);
SLinkedList<int>::Iterator it;
int expvalue = 0;
for(it = list.begin(); it != list.end(); ++it){
   assert(*it == expvalue);
    expvalue += 1;
```

Passed all tests! 🗸

Chính xác



Câu hỏi 5

Chính xác

Điểm 1,00 của 1,00

Class LLNode is used to store a node in a singly linked list, described on the following:

```
class LLNode {
   public:
      int val;
      LLNode* next;
      LLNode();
      LLNode(int val, LLNode* next);
}
```

Where val is the value of node, next is the pointer to the next node.

Request: Implement function:

```
LLNode* addLinkedList(LLNode* 10, LLNode* 11);
```

Where 10, 11 are two linked lists represented positive integers, each node is a digit, the head is the least significant digit (the value of each node is between 0 and 9, the length of each linked list is between 0 and 100000). This function returns the linked list representing the sum of the two integers.

Example:

Given 10 = [2, 3] (representing 32) and 11 = [1, 8] (representing 81). The result would be 10 = [3, 1, 1] (representing 32 + 81 = 113).

Note:

In this exercise, the libraries iostream, string, cstring, climits, utility, vector, list, stack, queue, map, unordered_map, set, unordered_set, functional, algorithm has been included and namespace std are used. You can write helper functions and classes. Importing other libraries is allowed, but not encouraged, and may result in unexpected errors.

For example:

Test			Result	
<pre>int arr1[] = {2, 9}; int arr2[] = {0, 5}; LLNode* head1 = LLNode::createWithIterators(arr1, arr1 + sizeof(arr1) / sizeof(int)); LLNode* head2 = LLNode::createWithIterators(arr2, arr2 + sizeof(arr2) / sizeof(int)); LLNode* newhead = addLinkedList(head1, head2); LLNode::printList(newhead); head1->clear(); head2->clear();</pre>				1]
<pre>t arr1[] = {2, 9}; t arr2[] = {0, 5}; Node* head1 = LLNode::createWithIterators(arr1, arr1 + sizeof(arr1) / sizeof(int)); Node* head2 = LLNode::createWithIterators(arr2, arr2 + sizeof(arr2) -/ sizeof(int)); Node* newhead = addLinkedList(head1, head2); Node::printList(newhead); ad1->clear(); ad2->clear();</pre>				
head1->clear();				
head2->clear();				
<pre>newhead->clear();</pre>				

Answer: (penalty regime: 0, 0, 0, 5, 10, ... %)

```
LLNode* addLinkedList(LLNode* 10, LLNode* 11) {
        LLNode* tmp0 = 10;
2
3
        LLNode* tmp1 = 11;
 4
        queue<int> st0;
 5
        queue<int> st1;
 6
        //fine value
 7
        //long long int value0 = 0;
 8
        //long long int value1 = 0;
9
        if (10 == nullptr && 11 == nullptr) return nullptr;
10
        if (l1 == nullptr) {
            //LLNode* tmp = tmp0;
11
12
            LLNode* newHead = new LLNode(tmp0->val, nullptr);
            LLNode* tmp = newHead;
13
14
            tmp0 = tmp0->next;
15
            while (tmp0 != nullptr) {
                LLNode* newNode = new LLNode(tmp0->val, nullptr);
16
                tmp->next = newNode;
```

```
18
                 tmp = newNode;
19
                 tmp0 = tmp0->next;
20
            return newHead;
21
22 ▼
```

	Test	Expected	Got	
~	<pre>int arr1[] = {2, 9}; int arr2[] = {0, 5}; LLNode* head1 = LLNode::createWithIterators(arr1, arr1 + sizeof(arr1) / sizeof(int)); LLNode* head2 = LLNode::createWithIterators(arr2, arr2 + sizeof(arr2) / sizeof(int)); LLNode* newhead = addLinkedList(head1, head2); LLNode::printList(newhead); head1->clear(); head2->clear(); newhead->clear();</pre>	[2, 4, 1]	[2, 4, 1]	~

Passed all tests! ✓

Chính xác

Điểm cho bài nộp này: 1,00/1,00.



10

Câu hỏi 6

Chính xác

Điểm 1,00 của 1,00

Class LLNode representing a node of singly linked lists is declared as below:

```
class LLNode {
public:
    int val;
    LLNode* next;
    LLNode(); // Constructor: val = 0, next = nullptr
    LLNode(int val, LLNode* next); // Constructor with customized data
}
```

Given a singly linked list head node and a integer k.

Your task is to implement a function with following prototype:

```
LLNode* rotateLinkedList(LLNode* head, int k);
```

The function returns head node of the rotated singly linked list obtained after rotate the linked list to the right by k places.

Note:

- The iostream library has been used and namespace std is being used. No other libraries are allowed.
- The constructors and methods of class LLNode have been defined fully so you do not need to redefine them.
- You can write helper functions.

For example:

Test	Ø	CM		Result
int arr[] = {2, 4, 6, 6, 3};			-0	[2, 4, 6, 6, 3]
int k = 3;		-:	(-: ((:-+))	[6, 6, 3, 2, 4]
<pre>LLNode* head = LLNode::createWithIter LLNode::printList(head);</pre>	rators(arr, arr + :	sizeof(arr)	/ sizeof(int));	
cout << "\n";		, ,		
LLNode* newhead = rotateLinkedList(he LLNode::printList(newhead);	ead, k);	IỆU S	รูบบ า	ÂΡ

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Answer: (penalty regime: 0 %)

```
1 | LLNode* rotateLinkedList(LLNode* head, int k) {
 2
        if(head == nullptr) return nullptr;
 3
        LLNode* tmp0 = head;
 4
        if(k==0){
            LLNode* newHead = new LLNode(tmp0->val, nullptr);
 5
            LLNode* tmp = newHead;
 6
 7
            tmp0 = tmp0->next;
            while (tmp0 != nullptr) {
 8
 9
                LLNode* newNode = new LLNode(tmp0->val, nullptr);
10
                tmp->next = newNode;
11
                tmp = newNode;
                tmp0 = tmp0->next;
12
13
14
            return newHead;
15
        //stack<int> result;
16
        tmp0 = head;
17
18
        int len = 1;
19
        for(len = len; tmp0 != nullptr; len++) tmp0 = tmp0->next;
20
21
        while(k>len) k-=len;
22
        int* left = new int[len-k];
```

	Test	Expected	Got	
*	<pre>int arr[] = {2, 4, 6, 6, 3}; int k = 3; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = rotateLinkedList(head, k); LLNode::printList(newhead);</pre>	[2, 4, 6, 6, 3] [6, 6, 3, 2, 4]	[2, 4, 6, 6, 3] [6, 6, 3, 2, 4]	~
~	<pre>int arr[] = {}; int k = 2; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = rotateLinkedList(head, k); LLNode::printList(newhead);</pre>			~
~	<pre>int arr[] = {0, 4, 2, 5, 1, 0, 6, 4, 8, 6}; int k = 11; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = rotateLinkedList(head, k); LLNode::printList(newhead);</pre>	[0, 4, 2, 5, 1, 0, 6, 4, 8, 6] [6, 0, 4, 2, 5, 1, 0, 6, 4, 8]	[0, 4, 2, 5, 1, 0, 6, 4, 8, 6] [6, 0, 4, 2, 5, 1, 0, 6, 4, 8]	~
*	<pre>int arr[] = {6, 1, 3, 2, 6, 0, 0, 0, 3, 3, 9, 8, 5, 6, 0, 7, 7, 8, 5, 7, 7, 9, 6, 3, 3, 0, 0, 8, 0, 0, 4, 9, 7, 1, 7, 2, 7, 5, 4, 4, 7, 5, 9, 2, 4, 5, 7, 9, 7, 9, 7, 2, 0, 6, 7, 6, 5, 1, 9, 7, 1, 2, 7, 8, 7, 5, 4, 7, 6, 9, 0, 2, 7, 0, 5, 5, 6, 8, 3, 1, 9, 3, 0, 1, 4, 6, 6, 9, 2, 2, 0, 6, 7, 4, 4, 6, 0, 7, 3, 5, 2, 9, 1, 0, 9}; int k = 35; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = rotateLinkedList(head, k); LLNode::printList(newhead);</pre>	4, 9, 7, 1, 7, 2, 7, 5, 4, 4, 7, 5, 9, 2, 4, 5, 7, 9, 7, 9, 7, 2, 0, 6, 7, 6, 5, 1, 9, 7, 1, 2, 7, 8, 7, 5, 4, 7, 6, 9, 0, 2, 7, 0, 5, 5, 6, 8, 3, 1, 9, 3, 0, 1, 4, 6, 6, 9, 2, 2, 0, 6, 7, 4, 4, 6, 0, 7, 3, 5, 2, 9, 1, 0, 9]	[6, 1, 3, 2, 6, 0, 0, 0, 3, 3, 9, 8, 5, 6, 0, 7, 7, 8, 5, 7, 7, 9, 6, 3, 3, 0, 0, 8, 0, 0, 4, 9, 7, 1, 7, 2, 7, 5, 4, 4, 7, 5, 9, 2, 4, 5, 7, 9, 7, 9, 7, 2, 0, 6, 7, 6, 5, 1, 9, 7, 1, 2, 7, 8, 7, 5, 6, 8, 3, 1, 9, 3, 0, 1, 4, 6, 6, 9, 2, 2, 0, 6, 7, 4, 4, 6, 0, 7, 3, 5, 2, 9, 1, 0, 9] [0, 2, 7, 0, 5, 5, 6, 8, 3, 1, 9, 3, 0, 1, 4, 6, 6, 9, 2, 2, 0, 6, 7, 4, 4, 6, 0, 7, 3, 5, 2, 9, 1, 0, 9] [0, 2, 7, 0, 5, 5, 6, 8, 3, 1, 9, 3, 0, 1, 4, 6, 6, 9, 2, 2, 0, 6, 7, 4, 4, 6, 0, 7, 3, 5, 2, 9, 1, 0, 9, 6, 1, 3, 2, 6, 0, 0, 0, 3, 3, 9, 8, 5, 6, 0, 7, 7, 8, 5, 7, 7, 9, 6, 3, 3, 0, 0, 8, 0, 0, 4, 9, 7, 1, 7, 2, 7, 5, 4, 4, 7, 5, 9, 2, 4, 5, 7, 9, 7, 9, 7, 2, 0, 6, 7, 6, 5, 1, 9, 7, 1, 2, 7, 8, 7, 5, 4, 7, 6, 9]	~

T	est	Expected	Got	
i	nt arr[] = {9, 1, 7, 5, 8, 6, 2, 2, 2, 6, 0, 8, 1,	[9, 1, 7, 5, 8, 6, 2, 2, 2, 6,	[9, 1, 7, 5, 8, 6, 2, 2, 2, 6,	-
9	, 6, 8, 4, 8, 4, 3, 7, 0, 7, 8, 9, 5, 3, 4, 7, 4,	0, 8, 1, 9, 6, 8, 4, 8, 4, 3,	0, 8, 1, 9, 6, 8, 4, 8, 4, 3,	
3	, 5, 2, 2, 7, 8, 9, 7, 1, 9, 9, 8, 3, 5, 7, 1, 6,	7, 0, 7, 8, 9, 5, 3, 4, 7, 4,	7, 0, 7, 8, 9, 5, 3, 4, 7, 4,	
9	, 1, 2, 0, 6, 8, 0, 4, 1, 6, 5, 8, 7, 6, 8, 0, 5,	3, 5, 2, 2, 7, 8, 9, 7, 1, 9,	3, 5, 2, 2, 7, 8, 9, 7, 1, 9,	
7	, 8, 8, 6, 7, 5, 8, 0, 7, 6, 4, 9, 5, 9, 6, 4, 1,	9, 8, 3, 5, 7, 1, 6, 9, 1, 2,	9, 8, 3, 5, 7, 1, 6, 9, 1, 2,	
	, 6, 2, 2, 6, 7, 0, 3, 4, 2, 3, 9, 0, 9, 6, 3, 6,	0, 6, 8, 0, 4, 1, 6, 5, 8, 7,	0, 6, 8, 0, 4, 1, 6, 5, 8, 7,	
	, 5, 5, 5, 9, 0, 6, 1, 1, 5, 0, 9, 1, 1, 1, 0, 4,	6, 8, 0, 5, 7, 8, 8, 6, 7, 5,	6, 8, 0, 5, 7, 8, 8, 6, 7, 5,	
	, 3, 3, 5, 8, 7, 4, 7, 1, 7, 1, 8, 4, 2, 0, 1,	8, 0, 7, 6, 4, 9, 5, 9, 6, 4,	8, 0, 7, 6, 4, 9, 5, 9, 6, 4,	
	, 0, 7, 9, 2, 8, 9, 2, 5, 3, 5, 9, 3, 2, 7, 3, 5,	1, 5, 6, 2, 2, 6, 7, 0, 3, 4,	1, 5, 6, 2, 2, 6, 7, 0, 3, 4,	
	, 5, 5, 3, 2, 3, 9, 4, 1, 6, 1, 8, 3, 1, 4, 5, 2,	2, 3, 9, 0, 9, 6, 3, 6, 7, 5,	2, 3, 9, 0, 9, 6, 3, 6, 7, 5,	
	, 7, 7, 0, 9, 6, 6, 4, 8, 1, 1, 6, 0, 2, 6, 0, 7,	5, 5, 9, 0, 6, 1, 1, 5, 0, 9,	5, 5, 9, 0, 6, 1, 1, 5, 0, 9,	
	, 5, 0, 5, 2, 6, 9, 9, 9, 9, 2, 3, 0, 6, 8, 8, 4,	1, 1, 1, 0, 4, 6, 3, 3, 3, 5,	1, 1, 1, 0, 4, 6, 3, 3, 3, 5,	
	, 6, 2, 8, 5, 9, 8, 3, 6, 8, 8, 6, 2, 1, 2, 1, 4, , 2, 0, 9, 3, 9, 6, 4, 2, 3, 6, 2, 0, 9, 8, 7, 0,	8, 7, 4, 7, 1, 7, 1, 8, 4, 2, 0, 1, 9, 0, 7, 9, 2, 8, 9, 2,	8, 7, 4, 7, 1, 7, 1, 8, 4, 2, 0, 1, 9, 0, 7, 9, 2, 8, 9, 2,	
	, 0, 7, 0, 5, 9, 4, 3, 7, 9, 7, 3, 5, 7, 0, 3, 1,	5, 3, 5, 9, 3, 2, 7, 3, 5, 9,	5, 3, 5, 9, 3, 2, 7, 3, 5, 9,	
	, 9, 9, 4, 0, 8, 6, 4, 6, 7, 3, 8, 1, 2, 1, 5, 4,	5, 5, 3, 2, 3, 9, 4, 1, 6, 1,	5, 5, 3, 2, 3, 9, 4, 1, 6, 1,	
	, 5, 9, 5, 8, 6, 6, 8, 9, 4, 4, 0, 6, 4, 5, 3, 0,	8, 3, 1, 4, 5, 2, 5, 7, 7, 0,	8, 3, 1, 4, 5, 2, 5, 7, 7, 0,	
	, 9, 7, 1, 7, 2, 5, 0, 1, 9, 1, 2, 5, 6, 8, 7, 1,	9, 6, 6, 4, 8, 1, 1, 6, 0, 2,	9, 6, 6, 4, 8, 1, 1, 6, 0, 2,	
	, 9, 6, 2, 8, 1, 2, 0, 4, 3, 4, 6, 7, 1, 0, 7, 0,	6, 0, 7, 5, 5, 0, 5, 2, 6, 9,	6, 0, 7, 5, 5, 0, 5, 2, 6, 9,	
	, 9, 4, 0, 1, 2, 3, 5, 6, 3, 5, 6, 7, 5, 4, 2, 4,	9, 9, 9, 2, 3, 0, 6, 8, 8, 4,	9, 9, 9, 2, 3, 0, 6, 8, 8, 4,	
	, 2, 5, 8, 8, 6, 6, 2, 6, 6, 8, 1, 2, 2, 8, 0, 8,	5, 6, 2, 8, 5, 9, 8, 3, 6, 8,	5, 6, 2, 8, 5, 9, 8, 3, 6, 8,	
	, 0, 7, 9, 0, 1, 6, 6, 3, 6, 5, 1, 5, 9, 0, 3, 7,	8, 6, 2, 1, 2, 1, 4, 6, 2, 0,	8, 6, 2, 1, 2, 1, 4, 6, 2, 0,	
3	, 7, 2, 0, 0, 2, 7, 5, 2, 9, 5, 5, 8, 1, 7, 7, 9,	9, 3, 9, 6, 4, 2, 3, 6, 2, 0,	9, 3, 9, 6, 4, 2, 3, 6, 2, 0,	
7	, 1, 1, 6, 4, 3, 8, 0, 7, 9, 1, 0, 9, 5, 2, 7, 2,	9, 8, 7, 0, 6, 0, 7, 0, 5, 9,	9, 8, 7, 0, 6, 0, 7, 0, 5, 9,	
1	, 5, 3, 9, 7, 6, 9, 1, 3, 5, 5, 0, 6, 9, 4, 7, 1,	4, 3, 7, 9, 7, 3, 5, 7, 0, 3,	4, 3, 7, 9, 7, 3, 5, 7, 0, 3,	
7	, 2, 0, 4, 5, 8, 1, 6, 1, 0, 7, 2, 2, 6, 7, 4, 4,	1, 8, 9, 9, 4, 0, 8, 6, 4, 6,	1, 8, 9, 9, 4, 0, 8, 6, 4, 6,	
9	, 5, 4, 5, 2, 0, 8, 0, 5, 5, 1, 8, 9, 4, 5, 6, 1,	7, 3, 8, 1, 2, 1, 5, 4, 9, 5,	7, 3, 8, 1, 2, 1, 5, 4, 9, 5,	
	, 0, 7, 0, 2, 1, 6, 8, 8, 7, 8, 7, 0, 1, 8, 5, 6,	9, 5, 8, 6, 6, 8, 9, 4, 4, 0,	9, 5, 8, 6, 6, 8, 9, 4, 4, 0,	
	, 9, 2, 2, 9, 3, 6, 0, 1, 7, 9, 8, 1, 1, 5, 4, 5,	6, 4, 5, 3, 0, 3, 9, 7, 1, 7,	6, 4, 5, 3, 0, 3, 9, 7, 1, 7,	
	, 5, 0, 2, 0, 4, 4, 8, 0, 7, 3};	2, 5, 0, 1, 9, 1, 2, 5, 6, 8,	2, 5, 0, 1, 9, 1, 2, 5, 6, 8,	
	nt k = 196;	7, 1, 6, 9, 6, 2, 8, 1, 2, 0,	7, 1, 6, 9, 6, 2, 8, 1, 2, 0,	
	<pre>LNode* head = LLNode::createWithIterators(arr, arr sizeof(arr) / sizeof(int));</pre>	4, 3, 4, 6, 7, 1, 0, 7, 0, 7,	4, 3, 4, 6, 7, 1, 0, 7, 0, 7,	
	LNode::printList(head);	9, 4, 0, 1, 2, 3, 5, 6, 3, 5, 6, 7, 5, 4, 2, 4, 8, 2, 5, 8,	9, 4, 0, 1, 2, 3, 5, 6, 3, 5,	
	out << "\n":	8, 6, 6, 2, 6, 6, 8, 1, 2, 2,	6, 7, 5, 4, 2, 4, 8, 2, 5, 8, 8, 6, 6, 2, 6, 6, 8, 1, 2, 2,	
1 -	LNode* newhead = rotateLinkedList(head, k);	8, 0, 8, 9, 0, 7, 9, 0, 1, 6,	8, 0, 8, 9, 0, 7, 9, 0, 1, 6,	
	LNode::printList(newhead);	6, 3, 6, 5, 1, 5, 9, 0, 3, 7,	6, 3, 6, 5, 1, 5, 9, 0, 3, 7,	
-		3, 7, 2, 0, 0, 2, 7, 5, 2, 9,	3, 7, 2, 0, 0, 2, 7, 5, 2, 9,	
	BỞI H		5, 5, 8, 1, 7, 7, 9, 7, 1, 1,	
		6, 4, 3, 8, 0, 7, 9, 1, 0, 9,	6, 4, 3, 8, 0, 7, 9, 1, 0, 9,	
		5, 2, 7, 2, 1, 5, 3, 9, 7, 6,	5, 2, 7, 2, 1, 5, 3, 9, 7, 6,	
		9, 1, 3, 5, 5, 0, 6, 9, 4, 7,	9, 1, 3, 5, 5, 0, 6, 9, 4, 7,	
		1, 7, 2, 0, 4, 5, 8, 1, 6, 1,	1, 7, 2, 0, 4, 5, 8, 1, 6, 1,	
		0, 7, 2, 2, 6, 7, 4, 4, 9, 5,	0, 7, 2, 2, 6, 7, 4, 4, 9, 5,	
		4, 5, 2, 0, 8, 0, 5, 5, 1, 8,	4, 5, 2, 0, 8, 0, 5, 5, 1, 8,	
		9, 4, 5, 6, 1, 2, 0, 7, 0, 2,	9, 4, 5, 6, 1, 2, 0, 7, 0, 2,	
		1, 6, 8, 8, 7, 8, 7, 0, 1, 8,	1, 6, 8, 8, 7, 8, 7, 0, 1, 8,	
		5, 6, 5, 9, 2, 2, 9, 3, 6, 0,	5, 6, 5, 9, 2, 2, 9, 3, 6, 0,	
		1, 7, 9, 8, 1, 1, 5, 4, 5, 7,	1, 7, 9, 8, 1, 1, 5, 4, 5, 7,	
		[6 2 8 1 2 0 4 3 4 6	[6 2 8 1 2 0 4 3 4 6	
		[6, 2, 8, 1, 2, 0, 4, 3, 4, 6, 7, 1, 0, 7, 0, 7, 9, 4, 0, 1,	[6, 2, 8, 1, 2, 0, 4, 3, 4, 6, 7, 1, 0, 7, 0, 7, 9, 4, 0, 1,	
		2, 3, 5, 6, 3, 5, 6, 7, 5, 4,	2, 3, 5, 6, 3, 5, 6, 7, 5, 4,	
		2, 4, 8, 2, 5, 8, 8, 6, 6, 2,	2, 4, 8, 2, 5, 8, 8, 6, 6, 2,	
		6, 6, 8, 1, 2, 2, 8, 0, 8, 9,	6, 6, 8, 1, 2, 2, 8, 0, 8, 9,	
		0, 7, 9, 0, 1, 6, 6, 3, 6, 5,	0, 7, 9, 0, 1, 6, 6, 3, 6, 5,	
		1, 5, 9, 0, 3, 7, 3, 7, 2, 0,	1, 5, 9, 0, 3, 7, 3, 7, 2, 0,	
		0, 2, 7, 5, 2, 9, 5, 5, 8, 1,	0, 2, 7, 5, 2, 9, 5, 5, 8, 1,	
		7, 7, 9, 7, 1, 1, 6, 4, 3, 8,	7, 7, 9, 7, 1, 1, 6, 4, 3, 8,	
		0, 7, 9, 1, 0, 9, 5, 2, 7, 2,	0, 7, 9, 1, 0, 9, 5, 2, 7, 2,	
		1, 5, 3, 9, 7, 6, 9, 1, 3, 5,	1, 5, 3, 9, 7, 6, 9, 1, 3, 5,	
		5, 0, 6, 9, 4, 7, 1, 7, 2, 0,	5, 0, 6, 9, 4, 7, 1, 7, 2, 0,	
			I .	
		4, 5, 8, 1, 6, 1, 0, 7, 2, 2,	4, 5, 8, 1, 6, 1, 0, 7, 2, 2,	
			4, 5, 8, 1, 6, 1, 0, 7, 2, 2, 6, 7, 4, 4, 9, 5, 4, 5, 2, 0,	

Test	Expected	Got
	1, 2, 0, 7, 0, 2, 1, 6, 8, 8	, 1, 2, 0, 7, 0, 2, 1, 6, 8, 8,
	7, 8, 7, 0, 1, 8, 5, 6, 5, 9	7, 8, 7, 0, 1, 8, 5, 6, 5, 9,
	2, 2, 9, 3, 6, 0, 1, 7, 9, 8	2, 2, 9, 3, 6, 0, 1, 7, 9, 8,
	1, 1, 5, 4, 5, 7, 5, 0, 2, 0	1, 1, 5, 4, 5, 7, 5, 0, 2, 0,
	4, 4, 8, 0, 7, 3, 9, 1, 7, 5	4, 4, 8, 0, 7, 3, 9, 1, 7, 5,
	8, 6, 2, 2, 2, 6, 0, 8, 1, 9	8, 6, 2, 2, 2, 6, 0, 8, 1, 9,
	6, 8, 4, 8, 4, 3, 7, 0, 7, 8	6, 8, 4, 8, 4, 3, 7, 0, 7, 8,
	9, 5, 3, 4, 7, 4, 3, 5, 2, 2	9, 5, 3, 4, 7, 4, 3, 5, 2, 2,
	7, 8, 9, 7, 1, 9, 9, 8, 3, 5	7, 8, 9, 7, 1, 9, 9, 8, 3, 5,
	7, 1, 6, 9, 1, 2, 0, 6, 8, 0	7, 1, 6, 9, 1, 2, 0, 6, 8, 0,
	4, 1, 6, 5, 8, 7, 6, 8, 0, 5	4, 1, 6, 5, 8, 7, 6, 8, 0, 5,
	7, 8, 8, 6, 7, 5, 8, 0, 7, 6	7, 8, 8, 6, 7, 5, 8, 0, 7, 6,
	4, 9, 5, 9, 6, 4, 1, 5, 6, 2	4, 9, 5, 9, 6, 4, 1, 5, 6, 2,
	2, 6, 7, 0, 3, 4, 2, 3, 9, 0	
	9, 6, 3, 6, 7, 5, 5, 5, 9, 0	9, 6, 3, 6, 7, 5, 5, 5, 9, 0,
	6, 1, 1, 5, 0, 9, 1, 1, 1, 0	
	4, 6, 3, 3, 5, 8, 7, 4, 7	
	1, 7, 1, 8, 4, 2, 0, 1, 9, 0	
	7, 9, 2, 8, 9, 2, 5, 3, 5, 9	
	3, 2, 7, 3, 5, 9, 5, 5, 3, 2	, 3, 2, 7, 3, 5, 9, 5, 5, 3, 2,
	3, 9, 4, 1, 6, 1, 8, 3, 1, 4	
	5, 2, 5, 7, 7, 0, 9, 6, 6, 4	
	8, 1, 1, 6, 0, 2, 6, 0, 7, 5	
	5, 0, 5, 2, 6, 9, 9, 9, 9, 2	
	3, 0, 6, 8, 8, 4, 5, 6, 2, 8	
	5, 9, 8, 3, 6, 8, 8, 6, 2, 1	
	2, 1, 4, 6, 2, 0, 9, 3, 9, 6	
	4, 2, 3, 6, 2, 0, 9, 8, 7, 0	
	6, 0, 7, 0, 5, 9, 4, 3, 7, 9	
	3, 0, 6, 8, 8, 4, 5, 6, 2, 8 5, 9, 8, 3, 6, 8, 8, 6, 2, 1 2, 1, 4, 6, 2, 0, 9, 3, 9, 6 4, 2, 3, 6, 2, 0, 9, 8, 7, 0 6, 0, 7, 0, 5, 9, 4, 3, 7, 9 7, 3, 5, 7, 0, 3, 1, 8, 9, 9	
	4, 0, 0, 4, 0, 7, 3, 8, 1	
	2, 1, 5, 4, 9, 5, 9, 5, 8, 6	
	6, 8, 9, 4, 4, 0, 6, 4, 5, 3	
	0, 3, 9, 7, 1, 7, 2, 5, 0, 1	, 0, 3, 9, 7, 1, 7, 2, 5, 0, 1,

TÀI LIỆU SƯU TẬP

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Test	Expected	Got	
int arr[] = {8, 0, 8, 8, 9, 3, 3, 5, 4, 9, 7, 9	, 5, [8, 0, 8, 8, 9, 3, 3, 5, 4, 9,	[8, 0, 8, 8, 9, 3, 3, 5, 4, 9,	~
3, 8, 6, 1, 0, 6, 4, 5, 1, 1, 5, 3, 8, 6, 1, 1,	1, 7, 9, 5, 3, 8, 6, 1, 0, 6, 4,	7, 9, 5, 3, 8, 6, 1, 0, 6, 4,	
0, 1, 4, 9, 0, 1, 8, 0, 2, 7, 1, 5, 7, 6, 7, 7,	9, 5, 1, 1, 5, 3, 8, 6, 1, 1, 1,	5, 1, 1, 5, 3, 8, 6, 1, 1, 1,	
5, 0, 9, 6, 3, 7, 6, 6, 4, 6, 2, 9, 1, 5, 0, 8,		0, 1, 4, 9, 0, 1, 8, 0, 2, 7,	
0, 8, 6, 3, 0, 3, 6, 8, 5, 0, 1, 9, 9, 6, 3, 3,		1, 5, 7, 6, 7, 7, 9, 5, 0, 9,	
9, 2, 0, 0, 5, 0, 4, 6, 7, 2, 6, 5, 2, 8, 8, 7, 0, 9, 7, 7, 1, 5, 8, 7, 5, 7, 8, 7, 8, 7, 1, 7,		6, 3, 7, 6, 6, 4, 6, 2, 9, 1, 5, 0, 8, 6, 0, 8, 6, 3, 0, 3,	
, 1, 3, 0, 5, 5, 1, 0, 2, 1, 0, 1, 5, 3, 7, 7,		6, 8, 5, 0, 1, 9, 9, 6, 3, 3,	
, 1, 6, 4, 8, 9, 8, 6, 0, 0, 3, 6, 2, 3, 4, 9,		2, 9, 2, 0, 0, 5, 0, 4, 6, 7,	
, 2, 2, 9, 7, 7, 4, 9, 9, 7, 5, 6, 2, 4, 0, 1,		2, 6, 5, 2, 8, 8, 7, 1, 0, 9,	
, 8, 4, 6, 1, 2, 9, 6, 7, 9, 4, 7, 5, 2, 9, 4,	2, 7, 7, 1, 5, 8, 7, 5, 7, 8, 7,	7, 7, 1, 5, 8, 7, 5, 7, 8, 7,	
, 9, 4, 1, 6, 0, 0, 5, 0, 0, 6, 1, 7, 8, 6, 9,	5, 8, 7, 1, 7, 9, 7, 1, 3, 0, 5,	8, 7, 1, 7, 9, 7, 1, 3, 0, 5,	
, 7, 0, 5, 3, 2, 4, 9, 9, 2, 3, 4, 4, 1, 8, 2,		5, 1, 0, 2, 1, 0, 1, 5, 3, 7,	
6, 2, 0, 5, 9, 4, 5, 8, 1, 8, 4, 7, 5, 4, 9,		7, 9, 6, 1, 6, 4, 8, 9, 8, 6,	
, 1, 7, 7, 5, 4, 5, 6, 2, 1, 7, 5, 9, 7, 4, 8, , 9, 3, 4, 4, 3, 7, 1, 3, 9, 3, 3, 7, 9, 7, 9,		0, 0, 3, 6, 2, 3, 4, 9, 7, 4, 2, 2, 9, 7, 7, 4, 9, 9, 7, 5,	
, 0, 5, 5, 5, 6, 2, 5, 5, 9, 0, 2, 9, 0, 3, 8,		6, 2, 4, 0, 1, 9, 9, 8, 4, 6,	
, 1, 0, 4, 0, 7, 4, 2, 5, 0, 0, 6, 4, 3, 6, 0,		1, 2, 9, 6, 7, 9, 4, 7, 5, 2,	
2, 4, 1, 0, 3, 8, 0, 1, 7, 3, 8, 9, 0, 5, 3, 2,		9, 4, 2, 5, 9, 4, 1, 6, 0, 0,	
4, 0, 4, 6, 9, 8, 6, 5, 2, 7, 9, 0, 1, 7, 5, 5,	9, 5, 0, 0, 6, 1, 7, 8, 6, 9, 5,	5, 0, 0, 6, 1, 7, 8, 6, 9, 5,	
5, 6, 8, 2, 8, 6, 7, 4, 5, 9, 0, 2, 6, 8, 4, 3,		4, 7, 0, 5, 3, 2, 4, 9, 9, 2,	
9, 9, 1, 0, 3, 2, 3, 8, 1, 0, 5, 9, 6, 8, 9, 0,		3, 4, 4, 1, 8, 2, 4, 4, 6, 2,	
9, 4, 7, 5, 1, 7, 0, 3, 8, 9, 9, 1, 0, 3, 0, 4, 6, 6, 9, 1, 2, 5, 2, 3, 5, 1, 5, 0, 1, 6, 4, 8,		0, 5, 9, 4, 5, 8, 1, 8, 4, 7,	
6, 6, 9, 1, 2, 5, 2, 3, 5, 1, 5, 0, 1, 6, 4, 8, 4, 9, 5, 6, 5, 4, 2, 5, 9, 7, 3, 0, 6, 6, 8, 8 <mark>,</mark>	ADALMA	5, 4, 9, 7, 3, 1, 7, 7, 5, 4, 5, 6, 2, 1, 7, 5, 9, 7, 4, 8,	
1, 0, 5, 3, 5, 5, 9, 4, 8, 4, 6, 9, 3, 8, 3, 4,		4, 6, 9, 3, 4, 4, 3, 7, 1, 3,	
5, 8, 9, 7, 3, 4, 1, 0, 1, 2, 0, 0, 8, 1, 8, 5,		9, 3, 3, 7, 9, 7, 9, 4, 6, 0,	
5, 1, 0, 1, 1, 4, 0, 8, 7, 2, 8, 0, 0, 9, 6, 2,	1, 5, 5, 5, 6, 2, 5, 5, 9, 0, 2,	5, 5, 5, 6, 2, 5, 5, 9, 0, 2,	
, 1, 3, 4, 2, 5, 2, 0, 2, 5, 8, 1, 1, 6, 4, 6,	5, 9, 0, 3, 8, 7, 6, 1, 0, 4, 0,	9, 0, 3, 8, 7, 6, 1, 0, 4, 0,	
, 5, 9, 5, 8, 1, 8, 5, 4, 2, 0, 5, 5, 0, 1, 9,		7, 4, 2, 5, 0, 0, 6, 4, 3, 6,	
, 1, 7, 6, 1, 8, 8, 4, 6, 4, 4, 3, 1, 0, 3, 3,		0, 9, 2, 4, 1, 0, 3, 8, 0, 1,	
, 7, 9, 5, 1, 5, 1, 5, 2, 0, 3, 1, 4, 9, 2, 6, , 2, 7, 8, 1, 6, 7, 0, 2, 7, 6, 1, 5, 8, 3, 5,		7, 3, 8, 9, 0, 5, 3, 2, 8, 4, 0, 4, 6, 9, 8, 6, 5, 2, 7, 9,	
, 7, 9, 8, 8, 2, 6, 9, 9, 7, 8, 3, 8, 8, 0, 8,		0, 1, 7, 5, 5, 9, 5, 6, 8, 2,	
, 5, 7, 2, 0, 7, 3, 5, 5, 3, 5, 6, 2, 3, 3, 1,		8, 6, 7, 4, 5, 9, 0, 2, 6, 8,	
4, 4, 5, 5, 4, 9, 7, 0, 8, 0, 4, 3, 0, 9, 7,		4, 3, 5, 9, 9, 1, 0, 3, 2, 3,	
3, 1, 3, 7, 1, 5, 4, 7, 6, 3, 8, 6, 7 <mark>, 5, 4, 2,</mark>	0, 8, 1, 0, 5, 9, 6, 8, 9, 0, 9,	8, 1, 0, 5, 9, 6, 8, 9, 0, 9,	
, 7, 4, 7, 4, 6, 1, 3, 7, 2, 4, 4, 0, 1, 2, 9,	3	9, 4, 7, 5, 1, 7, 0, 3, 8, 9,	
, 5, 7, 1, 7, 7, 3, 2, 9, 8, 2, 4, 4, 9, 0, 5 ,		9, 1, 0, 3, 0, 4, 2, 6, 6, 9,	
7, 9, 1, 8, 3, 8, 2, 3, 2, 4, 6, 2, 0, 7, 5, 9,		1, 2, 5, 2, 3, 5, 1, 5, 0, 1,	
2, 2, 6, 8, 6, 9, 9, 3, 0, 4, 1, 5, 2, 3, 9, 3, 1, 7, 3, 1, 2, 8, 2, 0, 4, 1, 1, 8, 4, 8, 2, 0,		6, 4, 8, 8, 4, 9, 5, 6, 5, 4, 2, 5, 9, 7, 3, 0, 6, 6, 8, 8,	
5, 6, 5, 1, 3, 5, 0, 6, 1, 6, 1, 7, 9, 2, 3, 5,		7, 1, 0, 5, 3, 5, 5, 9, 4, 8,	
0, 6, 8, 3, 6, 9, 4, 1, 0, 8, 7, 2, 5, 7, 4, 4,		4, 6, 9, 3, 8, 3, 4, 9, 6, 8,	
, 0, 6, 6, 4, 9, 1, 8, 1, 1, 8, 8, 3, 5, 2, 5,	5, 9, 7, 3, 4, 1, 0, 1, 2, 0, 0,	9, 7, 3, 4, 1, 0, 1, 2, 0, 0,	
5, 1, 8, 3, 7, 8, 8, 1, 1, 5, 5, 1, 9, 7, 2, 2,		8, 1, 8, 5, 1, 5, 1, 0, 1, 1,	
2, 4, 4, 1, 0, 0, 0, 8, 7, 9, 4, 0, 0, 3, 5, 5,		4, 0, 8, 7, 2, 8, 0, 0, 9, 6,	
9, 5, 9, 3, 7, 5, 9, 0, 9, 8, 2, 7, 2, 0, 5, 2, 1, 6, 8, 5, 2, 4, 9, 8, 3, 9, 1, 9, 9, 2		2, 1, 5, 1, 3, 4, 2, 5, 2, 0,	
1, 6, 0, 8, 5, 2, 4, 9, 0, 8, 3, 9, 1, 9, 9, 2, 5, 3, 0, 5, 4, 4, 5, 3, 2, 0, 2, 4, 3, 5, 1, 9,		2, 5, 8, 1, 1, 6, 4, 6, 5, 8, 5, 9, 5, 8, 1, 8, 5, 4, 2, 0,	
0, 8, 1, 4, 4, 9, 9, 0, 9, 9, 1, 3, 0, 1, 1, 9,		5, 5, 0, 1, 9, 7, 1, 1, 7, 6,	
9, 2, 4, 4, 2, 5, 2, 3, 9, 6, 2, 3, 0, 8, 3, 2,		1, 8, 8, 4, 6, 4, 4, 3, 1, 0,	
8, 3, 0, 5, 1, 8, 8, 2, 9, 3, 7, 7, 4, 9, 6, 2,		3, 3, 7, 9, 7, 9, 5, 1, 5, 1,	
0, 6, 8, 4, 6, 7, 7, 8, 0, 7, 7, 5, 6, 5, 6, 2,	8, 5, 2, 0, 3, 1, 4, 9, 2, 6, 5,	5, 2, 0, 3, 1, 4, 9, 2, 6, 5,	
3, 2, 7, 5, 7, 4, 0, 0, 2, 2, 6, 7, 8, 5, 9, 3,		3, 2, 7, 8, 1, 6, 7, 0, 2, 7,	
0, 6, 5, 4, 5, 9, 4, 1, 2, 9, 7, 6, 2, 0, 2, 3,		6, 1, 5, 8, 3, 5, 0, 4, 7, 9,	
8, 0, 1, 8, 4, 7, 1, 0, 6, 4, 1, 0, 4, 0, 4, 8,		8, 8, 2, 6, 9, 9, 7, 8, 3, 8,	
5, 1, 0, 5, 2, 4, 5, 6, 3, 5, 2, 2, 9, 6, 0, 2, 2, 9, 7, 8, 3, 1, 6, 0, 2, 2, 7, 8, 9, 3, 4, 5,		8, 0, 8, 6, 4, 5, 7, 2, 0, 7, 3, 5, 5, 3, 5, 6, 2, 3, 3, 1,	
2, 9, 7, 8, 3, 1, 6, 0, 2, 2, 7, 8, 9, 3, 4, 5, 8, 4, 0, 7, 2, 8};	7, 3, 5, 5, 3, 5, 6, 2, 3, 3, 1, 2, 4, 4, 4, 5, 5, 4, 9, 7, 0,	3, 5, 5, 3, 5, 6, 2, 3, 3, 1, 2, 4, 4, 4, 5, 5, 4, 9, 7, 0,	
o, 4, 0, 7, 2, o;, int k = 389;	8, 0, 4, 3, 0, 9, 7, 7, 8, 1,	8, 0, 4, 3, 0, 9, 7, 7, 8, 1,	
LLNode* head = LLNode::createWithIterators(arr,		3, 7, 1, 5, 4, 7, 6, 3, 8, 6,	
+ sizeof(arr) / sizeof(int));	7, 5, 4, 2, 0, 6, 7, 4, 7, 4,	7, 5, 4, 2, 0, 6, 7, 4, 7, 4,	
<pre>LLNode::printList(head);</pre>	6, 1, 3, 7, 2, 4, 4, 0, 1, 2,	6, 1, 3, 7, 2, 4, 4, 0, 1, 2,	
cout << "\n";	9, 1, 9, 5, 7, 1, 7, 7, 3, 2,	9, 1, 9, 5, 7, 1, 7, 7, 3, 2,	
	BACH'KHOACNCP.COM	ı I	

Test	Expected	Got
<pre>LLNode* newhead = rotateLinkedList(head, k);</pre>	9, 8, 2, 4, 4, 9, 0, 5, 6, 7,	9, 8, 2, 4, 4, 9, 0, 5, 6, 7,
LLNode::printList(newhead);	9, 1, 8, 3, 8, 2, 3, 2, 4, 6,	9, 1, 8, 3, 8, 2, 3, 2, 4, 6,
	2, 0, 7, 5, 9, 5, 2, 2, 6, 8,	2, 0, 7, 5, 9, 5, 2, 2, 6, 8,
	6, 9, 9, 3, 0, 4, 1, 5, 2, 3,	6, 9, 9, 3, 0, 4, 1, 5, 2, 3,
	9, 3, 9, 1, 7, 3, 1, 2, 8, 2,	9, 3, 9, 1, 7, 3, 1, 2, 8, 2,
	0, 4, 1, 1, 8, 4, 8, 2, 0, 0,	0, 4, 1, 1, 8, 4, 8, 2, 0, 0,
	6, 6, 5, 1, 3, 5, 0, 6, 1, 6,	6, 6, 5, 1, 3, 5, 0, 6, 1, 6,
	1, 7, 9, 2, 3, 5, 2, 9, 6, 8,	1, 7, 9, 2, 3, 5, 2, 9, 6, 8,
	3, 6, 9, 4, 1, 0, 8, 7, 2, 5,	3, 6, 9, 4, 1, 0, 8, 7, 2, 5,
	7, 4, 4, 0, 2, 0, 6, 6, 4, 9, 1, 8, 1, 1, 8, 8, 3, 5, 2, 5,	7, 4, 4, 0, 2, 0, 6, 6, 4, 9, 1, 8, 1, 1, 8, 8, 3, 5, 2, 5,
	5, 5, 1, 8, 3, 7, 8, 8, 1, 1,	5, 5, 1, 8, 3, 7, 8, 8, 1, 1,
	5, 5, 1, 9, 7, 2, 2, 7, 2, 4,	5, 5, 1, 9, 7, 2, 2, 7, 2, 4,
	4, 1, 0, 0, 0, 8, 7, 9, 4, 0,	4, 1, 0, 0, 0, 8, 7, 9, 4, 0,
	0, 3, 5, 5, 1, 9, 5, 9, 3, 7,	0, 3, 5, 5, 1, 9, 5, 9, 3, 7,
	5, 9, 0, 9, 8, 2, 7, 2, 0, 5,	5, 9, 0, 9, 8, 2, 7, 2, 0, 5,
	2, 5, 1, 6, 0, 8, 5, 2, 4, 9,	2, 5, 1, 6, 0, 8, 5, 2, 4, 9,
	0, 8, 3, 9, 1, 9, 9, 2, 5, 5,	0, 8, 3, 9, 1, 9, 9, 2, 5, 5,
	3, 0, 5, 4, 4, 5, 3, 2, 0, 2,	3, 0, 5, 4, 4, 5, 3, 2, 0, 2,
	4, 3, 5, 1, 9, 3, 0, 8, 1, 4,	4, 3, 5, 1, 9, 3, 0, 8, 1, 4,
	4, 9, 9, 0, 9, 9, 1, 3, 0, 1,	4, 9, 9, 0, 9, 9, 1, 3, 0, 1,
	1, 9, 6, 9, 2, 4, 4, 2, 5, 2,	1, 9, 6, 9, 2, 4, 4, 2, 5, 2,
	3, 9, 6, 2, 3, 0, 8, 3, 2, 8,	3, 9, 6, 2, 3, 0, 8, 3, 2, 8,
. 4. 1	4, 9, 9, 0, 9, 9, 1, 3, 0, 1, 1, 9, 6, 9, 2, 4, 4, 2, 5, 2, 3, 9, 6, 2, 3, 0, 8, 3, 2, 8, 8, 3, 0, 5, 1, 8, 8, 2, 9, 3, 7, 7, 4, 9, 6, 2, 0, 0, 6, 8, 4, 6, 7, 7, 8, 0, 7, 7, 5, 6, 5, 6, 2, 8, 3, 2, 7, 5, 7, 4, 0, 0, 2, 2, 6, 7, 8, 5, 9, 3, 3, 0, 6, 5, 4, 5, 9, 4, 1, 2, 9, 7, 6, 2, 0, 2, 3, 3, 8, 0, 1	8, 3, 0, 5, 1, 8, 8, 2, 9, 3,
VH.	7, 7, 4, 9, 6, 2, 0, 0, 6, 8,	7, 7, 4, 9, 6, 2, 0, 0, 6, 8,
ME	4, 6, 7, 7, 8, 0, 7, 7, 3, 6, 5 6 2 8 3 2 7 5 7 A	4, 6, 7, 7, 8, 0, 7, 7, 5, 6, 5, 6, 2, 8, 3, 2, 7, 5, 7, 4,
G'	0. 0. 2. 2. 6. 7. 8. 5. 9. 3.	0, 0, 2, 2, 6, 7, 8, 5, 9, 3,
A	3. 0. 6. 5. 4. 5. 9. 4. 1. 2.	3, 0, 6, 5, 4, 5, 9, 4, 1, 2,
m C	9, 7, 6, 2, 0, 2, 3, 3, 8, 0,	9, 7, 6, 2, 0, 2, 3, 3, 8, 0,
~ -	1, 8, 4, 7, 1, 0, 6, 4, 1, 0,	1, 8, 4, 7, 1, 0, 6, 4, 1, 0,
	4, 0, 4, 8, 9, 5, 1, 0, 5, 2,	4, 0, 4, 8, 9, 5, 1, 0, 5, 2,
	4, 5, 6, 3, 5, 2, 2, 9, 6, 0,	4, 5, 6, 3, 5, 2, 2, 9, 6, 0,
	2, 1, 2, 9, 7, 8, 3, 1, 6, 0,	2, 1, 2, 9, 7, 8, 3, 1, 6, 0,
	2, 2, 7, 8, 9, 3, 4, 5, 7, 8,	2, 2, 7, 8, 9, 3, 4, 5, 7, 8,
	4, 0, 7, 2, 8]	4, 0, 7, 2, 8]
IAILIE	[6, 3, 8, 6, 7, 5, 4, 2, 0, 6, 7, 4, 7, 4, 6, 1, 3, 7, 2, 4,	[6, 3, 8, 6, 7, 5, 4, 2, 0, 6,
		7, 4, 7, 4, 6, 1, 3, 7, 2, 4,
B Ó I F	4, 0, 1, 2, 9, 1, 9, 5, 7, 1,	4, 0, 1, 2, 9, 1, 9, 5, 7, 1,
	7, 7, 3, 2, 9, 8, 2, 4, 4, 9,	7, 7, 3, 2, 9, 8, 2, 4, 4, 9,
	0, 5, 6, 7, 9, 1, 8, 3, 8, 2, 3, 2, 4, 6, 2, 0, 7, 5, 9, 5,	0, 5, 6, 7, 9, 1, 8, 3, 8, 2, 3, 2, 4, 6, 2, 0, 7, 5, 9, 5,
	2, 2, 6, 8, 6, 9, 9, 3, 0, 4,	2, 2, 6, 8, 6, 9, 9, 3, 0, 4,
	1, 5, 2, 3, 9, 3, 9, 1, 7, 3,	1, 5, 2, 3, 9, 3, 9, 1, 7, 3,
	1, 2, 8, 2, 0, 4, 1, 1, 8, 4,	1, 2, 8, 2, 0, 4, 1, 1, 8, 4,
	8, 2, 0, 0, 6, 6, 5, 1, 3, 5,	8, 2, 0, 0, 6, 6, 5, 1, 3, 5,
	0, 6, 1, 6, 1, 7, 9, 2, 3, 5,	0, 6, 1, 6, 1, 7, 9, 2, 3, 5,
	2, 9, 6, 8, 3, 6, 9, 4, 1, 0,	2, 9, 6, 8, 3, 6, 9, 4, 1, 0,
	8, 7, 2, 5, 7, 4, 4, 0, 2, 0,	8, 7, 2, 5, 7, 4, 4, 0, 2, 0,
	6, 6, 4, 9, 1, 8, 1, 1, 8, 8,	6, 6, 4, 9, 1, 8, 1, 1, 8, 8,
	3, 5, 2, 5, 5, 5, 1, 8, 3, 7,	3, 5, 2, 5, 5, 5, 1, 8, 3, 7,
	8, 8, 1, 1, 5, 5, 1, 9, 7, 2,	8, 8, 1, 1, 5, 5, 1, 9, 7, 2,
	2, 7, 2, 4, 4, 1, 0, 0, 0, 8,	2, 7, 2, 4, 4, 1, 0, 0, 0, 8,
	7, 9, 4, 0, 0, 3, 5, 5, 1, 9,	7, 9, 4, 0, 0, 3, 5, 5, 1, 9,
	5, 9, 3, 7, 5, 9, 0, 9, 8, 2, 7, 2, 0, 5, 2, 5, 1, 6, 0, 8,	5, 9, 3, 7, 5, 9, 0, 9, 8, 2,
	5, 2, 4, 9, 0, 8, 3, 9, 1, 9,	7, 2, 0, 5, 2, 5, 1, 6, 0, 8, 5, 2, 4, 9, 0, 8, 3, 9, 1, 9,
	9, 2, 5, 5, 3, 0, 5, 4, 4, 5,	9, 2, 5, 5, 3, 0, 5, 4, 4, 5,
	3, 2, 0, 2, 4, 3, 5, 1, 9, 3,	3, 2, 0, 2, 4, 3, 5, 1, 9, 3,
	0, 8, 1, 4, 4, 9, 9, 0, 9, 9,	0, 8, 1, 4, 4, 9, 9, 0, 9, 9,
	1, 3, 0, 1, 1, 9, 6, 9, 2, 4,	1, 3, 0, 1, 1, 9, 6, 9, 2, 4,
	4, 2, 5, 2, 3, 9, 6, 2, 3, 0,	4, 2, 5, 2, 3, 9, 6, 2, 3, 0,
	8, 3, 2, 8, 8, 3, 0, 5, 1, 8,	8, 3, 2, 8, 8, 3, 0, 5, 1, 8,
		I '
	8, 2, 9, 3, 7, 7, 4, 9, 6, 2,	8, 2, 9, 3, 7, 7, 4, 9, 6, 2,

	Test	Expected	Got
		7, 7, 5, 6, 5, 6, 2, 8, 3, 2,	7, 7, 5, 6, 5, 6, 2, 8, 3, 2,
		7, 5, 7, 4, 0, 0, 2, 2, 6, 7,	7, 5, 7, 4, 0, 0, 2, 2, 6, 7,
		8, 5, 9, 3, 3, 0, 6, 5, 4, 5,	8, 5, 9, 3, 3, 0, 6, 5, 4, 5,
		9, 4, 1, 2, 9, 7, 6, 2, 0, 2, 3, 3, 8, 0, 1, 8, 4, 7, 1, 0,	9, 4, 1, 2, 9, 7, 6, 2, 0, 2, 3, 3, 8, 0, 1, 8, 4, 7, 1, 0,
		6, 4, 1, 0, 4, 0, 4, 8, 9, 5,	6, 4, 1, 0, 4, 0, 4, 8, 9, 5,
		1, 0, 5, 2, 4, 5, 6, 3, 5, 2,	1, 0, 5, 2, 4, 5, 6, 3, 5, 2,
		2, 9, 6, 0, 2, 1, 2, 9, 7, 8,	2, 9, 6, 0, 2, 1, 2, 9, 7, 8,
		3, 1, 6, 0, 2, 2, 7, 8, 9, 3, 4, 5, 7, 8, 4, 0, 7, 2, 8, 8,	3, 1, 6, 0, 2, 2, 7, 8, 9, 3, 4, 5, 7, 8, 4, 0, 7, 2, 8, 8,
		0, 8, 8, 9, 3, 3, 5, 4, 9, 7,	0, 8, 8, 9, 3, 3, 5, 4, 9, 7,
		9, 5, 3, 8, 6, 1, 0, 6, 4, 5,	9, 5, 3, 8, 6, 1, 0, 6, 4, 5,
		1, 1, 5, 3, 8, 6, 1, 1, 1, 0, 1, 4, 9, 0, 1, 8, 0, 2, 7, 1,	1, 1, 5, 3, 8, 6, 1, 1, 1, 0, 1, 4, 9, 0, 1, 8, 0, 2, 7, 1,
		5, 7, 6, 7, 7, 9, 5, 0, 9, 6,	5, 7, 6, 7, 7, 9, 5, 0, 9, 6,
		3, 7, 6, 6, 4, 6, 2, 9, 1, 5,	3, 7, 6, 6, 4, 6, 2, 9, 1, 5,
		0, 8, 6, 0, 8, 6, 3, 0, 3, 6,	0, 8, 6, 0, 8, 6, 3, 0, 3, 6,
		8, 5, 0, 1, 9, 9, 6, 3, 3, 2, 9, 2, 0, 0, 5, 0, 4, 6, 7, 2,	8, 5, 0, 1, 9, 9, 6, 3, 3, 2, 9, 2, 0, 0, 5, 0, 4, 6, 7, 2,
		6, 5, 2, 8, 8, 7, 1, 0, 9, 7,	6, 5, 2, 8, 8, 7, 1, 0, 9, 7,
		7, 1, 5, 8, 7, 5, 7, 8, 7, 8,	7, 1, 5, 8, 7, 5, 7, 8, 7, 8,
		7, 1, 7, 9, 7, 1, 3, 0, 5, 5,	7, 1, 7, 9, 7, 1, 3, 0, 5, 5,
		1, 0, 2, 1, 0, 1, 5, 3, 7, 7, 9, 6, 1, 6, 4, 8, 9, 8, 6, 0,	1, 0, 2, 1, 0, 1, 5, 3, 7, 7, 9, 6, 1, 6, 4, 8, 9, 8, 6, 0,
	· H	0, 3, 6, 2, 3, 4, 9, 7, 4, 2,	0, 3, 6, 2, 3, 4, 9, 7, 4, 2,
	YK,	2, 9, 7, 7, 4, 9, 9, 7, 5, 6,	2, 9, 7, 7, 4, 9, 9, 7, 5, 6,
	C)	2, 4, 0, 1, 9, 9, 8, 4, 6, 1, 2, 9, 6, 7, 9, 4, 7, 5, 2, 9,	2, 4, 0, 1, 9, 9, 8, 4, 6, 1, 2, 9, 6, 7, 9, 4, 7, 5, 2, 9,
	OF CHIKH	4, 2, 5, 9, 4, 1, 6, 0, 0, 5,	4, 2, 5, 9, 4, 1, 6, 0, 0, 5,
	Ø C	0, 0, 6, 1, 7, 8, 6, 9, 5, 4,	0, 0, 6, 1, 7, 8, 6, 9, 5, 4,
		7, 0, 5, 3, 2, 4, 9, 9, 2, 3, 4, 4, 1, 8, 2, 4, 4, 6, 2, 0,	7, 0, 5, 3, 2, 4, 9, 9, 2, 3, 4, 4, 1, 8, 2, 4, 4, 6, 2, 0,
		5, 9, 4, 5, 8, 1, 8, 4, 7, 5,	5, 9, 4, 5, 8, 1, 8, 4, 7, 5,
		4, 9, 7, 3, 1, 7, 7, 5, 4, 5,	4, 9, 7, 3, 1, 7, 7, 5, 4, 5,
		6, 2, 1, 7, 5, 9, 7, 4, 8, 4, 6, 9, 3, 4, 4, 3, 7, 1, 3, 9,	6, 2, 1, 7, 5, 9, 7, 4, 8, 4, 6, 9, 3, 4, 4, 3, 7, 1, 3, 9,
	TÀLLÉ	3, 3, 7, 9, 7, 9, 4, 6, 0, 5,	3, 3, 7, 9, 7, 9, 4, 6, 0, 5,
	TAT EIE	5, 5, 6, 2, 5, 5, 9, 0, 2, 9,	5, 5, 6, 2, 5, 5, 9, 0, 2, 9,
	ΒΟΊ Η	0, 3, 8, 7, 6, 1, 0, 4, 0, 7, 4, 2, 5, 0, 0, 6, 4, 3, 6, 0,	0, 3, 8, 7, 6, 1, 0, 4, 0, 7, 4, 2, 5, 0, 0, 6, 4, 3, 6, 0,
		9, 2, 4, 1, 0, 3, 8, 0, 1, 7,	9, 2, 4, 1, 0, 3, 8, 0, 1, 7,
		3, 8, 9, 0, 5, 3, 2, 8, 4, 0,	3, 8, 9, 0, 5, 3, 2, 8, 4, 0,
		4, 6, 9, 8, 6, 5, 2, 7, 9, 0, 1, 7, 5, 5, 9, 5, 6, 8, 2, 8,	4, 6, 9, 8, 6, 5, 2, 7, 9, 0, 1, 7, 5, 5, 9, 5, 6, 8, 2, 8,
		6, 7, 4, 5, 9, 0, 2, 6, 8, 4,	6, 7, 4, 5, 9, 0, 2, 6, 8, 4,
		3, 5, 9, 9, 1, 0, 3, 2, 3, 8,	3, 5, 9, 9, 1, 0, 3, 2, 3, 8,
		1, 0, 5, 9, 6, 8, 9, 0, 9, 9, 4, 7, 5, 1, 7, 0, 3, 8, 9, 9,	1, 0, 5, 9, 6, 8, 9, 0, 9, 9, 4, 7, 5, 1, 7, 0, 3, 8, 9, 9,
		1, 0, 3, 0, 4, 2, 6, 6, 9, 1,	1, 0, 3, 0, 4, 2, 6, 6, 9, 1,
		2, 5, 2, 3, 5, 1, 5, 0, 1, 6,	2, 5, 2, 3, 5, 1, 5, 0, 1, 6,
		4, 8, 8, 4, 9, 5, 6, 5, 4, 2, 5, 9, 7, 3, 0, 6, 6, 8, 8, 7,	4, 8, 8, 4, 9, 5, 6, 5, 4, 2, 5, 9, 7, 3, 0, 6, 6, 8, 8, 7,
		1, 0, 5, 3, 5, 5, 9, 4, 8, 4,	1, 0, 5, 3, 5, 5, 9, 4, 8, 4,
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		7, 3, 4, 1, 0, 1, 2, 0, 0, 8, 1, 8, 5, 1, 5, 1, 0, 1, 1, 4,	7, 3, 4, 1, 0, 1, 2, 0, 0, 8,
		0, 8, 7, 2, 8, 0, 0, 9, 6, 2,	1, 8, 5, 1, 5, 1, 0, 1, 1, 4, 0, 8, 7, 2, 8, 0, 0, 9, 6, 2,
		1, 5, 1, 3, 4, 2, 5, 2, 0, 2,	1, 5, 1, 3, 4, 2, 5, 2, 0, 2,
		5, 8, 1, 1, 6, 4, 6, 5, 8, 5,	5, 8, 1, 1, 6, 4, 6, 5, 8, 5,
		9, 5, 8, 1, 8, 5, 4, 2, 0, 5, 5, 0, 1, 9, 7, 1, 1, 7, 6, 1,	9, 5, 8, 1, 8, 5, 4, 2, 0, 5, 5, 0, 1, 9, 7, 1, 1, 7, 6, 1,
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		2, 0, 3, 1, 4, 9, 2, 6, 5, 3, 2, 7, 8, 1, 6, 7, 0, 2, 7, 6,	2, 0, 3, 1, 4, 9, 2, 6, 5, 3, 2, 7, 8, 1, 6, 7, 0, 2, 7, 6,
	ВАСН	KHOACNCP.COM	

Test	Expected	Got
		1, 5, 8, 3, 5, 0, 4, 7, 9, 8,
	8, 2, 6, 9, 9, 7, 8, 3, 8, 8,	8, 2, 6, 9, 9, 7, 8, 3, 8, 8,
	0, 8, 6, 4, 5, 7, 2, 0, 7, 3,	0, 8, 6, 4, 5, 7, 2, 0, 7, 3,
	5, 5, 3, 5, 6, 2, 3, 3, 1, 2,	5, 5, 3, 5, 6, 2, 3, 3, 1, 2,
	4, 4, 4, 5, 5, 4, 9, 7, 0, 8,	4, 4, 4, 5, 5, 4, 9, 7, 0, 8,
	0, 4, 3, 0, 9, 7, 7, 8, 1, 3,	0, 4, 3, 0, 9, 7, 7, 8, 1, 3,
	7, 1, 5, 4, 7]	7, 1, 5, 4, 7]



	Test	Expected	Got	
	int arr[] = {3, 1, 6, 8, 6, 6, 1, 5, 7, 1, 7, 6, 7, 1, 9, 6, 8, 9, 7, 6, 4, 0, 3, 8, 9, 4, 7, 1, 1, 6,	[3, 1, 6, 8, 6, 6, 1, 5, 7, 1, 7, 6, 7, 1, 9, 6, 8, 9, 7, 6,	[3, 1, 6, 8, 6, 6, 1, 5, 7, 1, 7, 6, 7, 1, 9, 6, 8, 9, 7, 6,	•
	9, 3, 8, 8, 0, 4, 9, 7, 4, 7, 6, 3, 4, 9, 9, 6, 4,	4, 0, 3, 8, 9, 4, 7, 1, 1, 6,	4, 0, 3, 8, 9, 4, 7, 1, 1, 6,	
	1, 1, 4, 8, 8, 1, 6, 5, 2, 8, 5, 3, 9, 0, 8, 9, 1,	9, 3, 8, 8, 0, 4, 9, 7, 4, 7,	9, 3, 8, 8, 0, 4, 9, 7, 4, 7,	
	6, 9, 3, 9, 6, 9, 9, 9, 3, 8, 8, 3, 0, 7, 8, 9, 1,	6, 3, 4, 9, 9, 6, 4, 1, 1, 4,	6, 3, 4, 9, 9, 6, 4, 1, 1, 4,	
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	9, 6, 2, 6, 9, 3, 6, 0, 6, 2, 2, 3, 5, 0, 5, 6, 5,	0, 0, 8, 2, 1, 7, 7, 3, 3, 5,	0, 0, 8, 2, 1, 7, 7, 3, 3, 5,	
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	2, 1, 4, 4, 7, 7, 0, 9, 4, 4, 6, 3, 8, 6, 4, 2, 8,	6, 0, 6, 2, 4, 5, 6, 5, 6, 2,	6, 0, 6, 2, 4, 5, 6, 5, 6, 2,	
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	0, 1, 8, 9, 7, 8, 1, 4, 2, 9, 3, 9, 1, 4, 2, 1, 1,	6, 2, 6, 9, 3, 6, 0, 6, 2, 2,	6, 2, 6, 9, 3, 6, 0, 6, 2, 2,	
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- 1	, , ., ., , ., , . , . , ., . , ., . , ., . , ., ., .,			
	8, 9, 0, 1, 4, 2, 1, 3, 8, 3, 0, 8, 9, 1, 3, 3, 8,	9, 8, 1, 1, 1, 6, 9, 8, 4, 5,	9, 8, 1, 1, 1, 6, 9, 8, 4, 5,	

Test	Expected	Got
0, 1, 0, 7, 8, 7, 5, 8, 2, 4, 3, 1, 0, 0, 8, 1, 2,	6, 5, 0, 4, 9, 9, 7, 6, 3, 1,	6, 5, 0, 4, 9, 9, 7, 6, 3, 1,
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9, 8, 9, 2, 2, 0, 5, 0, 9, 4, 4, 6, 8, 5, 9, 7, 1,	8, 2, 9, 0, 6, 3, 3, 5, 5, 0,	8, 2, 9, 0, 6, 3, 3, 5, 5, 0,
4, 6, 4, 5, 1, 5, 2, 2, 7, 3, 6, 4, 9, 2, 9, 7, 8,	8, 4, 7, 4, 4, 5, 9, 2, 7, 7,	8, 4, 7, 4, 4, 5, 9, 2, 7, 7,
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1, 3, 8, 4, 1, 6, 7, 6, 3, 4, 3, 5, 1, 8, 0, 8, 2,	6, 2, 2, 7, 4, 6, 7, 2, 5, 7,	6, 2, 2, 7, 4, 6, 7, 2, 5, 7,
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5, 8, 5, 6, 7, 2, 5, 3, 4, 6, 4, 4); int k = 18080; LLNode::createWithTerators(arr, arn k = sizeof(arr) / sizeof(arr)); LLNode head = LLNode::createWithTerators(arr, arn k = sizeof(arr) / sizeof(arr)); LLNode: printList(nead); cout < "\n" \n" \n" \n" \n" \n" \n" \n" \n" \n	6, 3, 8, 4, 8, 0, 4, 7, 7, 2, 9, 2, 6, 2, 8, 7, 7,	0, 9, 1, 0, 9, 1, 8, 3, 6, 8,	0, 9, 1, 0, 9, 1, 8, 3, 6, 8,
int k = 1000: Liklode' head = Liklode::createWithIterators(arr, apr is sizeof(arr) / sizeof(int)); Liklode::printList(head); cout < c'\n'': Liklode::printList(newhead); Liklode::printL	5, 9, 4, 4, 3, 0, 6, 2, 2, 6, 5, 4, 4, 7, 8, 0, 7,	1, 2, 8, 5, 9, 7, 1, 1, 5, 4,	1, 2, 8, 5, 9, 7, 1, 1, 5, 4,
LLNode* head = LLNode::createWithIterators(arr, arr) 4. sizeof(arr) / sizeof(int)); LLNode* newhead = rotateLinkedList(head, k); LLNode*:printList(newhead); 8. 7, 8, 9, 7, 9, 8, 6, 6, 5, 7, 3, 8, 7, 9, 9, 8, 6, 6, 5, 5, 8, 5, 3, LLNode*:printList(newhead); 8. 8, 8, 9, 9, 5, 5, 8, 5, 3, 9, 8, 7, 9, 4, 8, 2, 2, 6, 8, 4, 1, 4, 7, 2, 2, 1, 9, 6, 4, 8, 9, 5, 1, 9, 2, 6, 3, 9, 1, 9, 8, 7, 9, 4, 8, 2, 9, 5, 5, 8, 5, 3, 9, 8, 7, 9, 4, 8, 2, 2, 6, 8, 8, 9, 2, 1, 9, 9, 8, 6, 6, 4, 8, 9, 5, 1, 9, 2, 6, 3, 9, 1, 9, 6, 7, 3, 2, 6, 8, 8, 5, 4, 8, 4, 5, 6, 3, 7, 3, 3, 8, 7, 9, 9, 8, 7, 9, 4, 8, 2, 2, 6, 8, 8, 5, 4, 8, 4, 5, 6, 3, 7, 3, 3, 8, 7, 9, 9, 8, 7, 9, 4, 8, 2, 2, 6, 8, 9, 2, 8, 1, 2, 9, 9, 5, 1, 9, 2, 6, 3, 9, 1, 1, 9, 4, 1, 9, 4, 1, 9, 4, 1, 9, 4, 1, 9, 9, 3, 9, 9, 6, 4, 8, 2, 2, 1, 9, 9, 5, 1, 9, 2, 6, 1, 2, 9, 9, 5, 1, 9, 2, 6, 1, 2, 9, 9, 5, 1, 9, 2, 6, 1, 2, 9, 9, 5, 1, 9, 2, 8, 1, 2, 9, 9, 5, 1, 9, 2, 8, 1, 2, 9, 9, 5, 1, 9, 2, 8, 1, 2, 9, 9, 5, 1, 9, 2, 8, 1, 2, 9, 9, 5, 1, 9, 2, 8, 1, 2, 9, 9, 5, 1, 9, 2, 8, 1, 2, 9, 9, 5, 1, 9, 2, 8, 1, 1, 9, 9, 1, 9, 1, 9, 1, 9, 1, 1, 9, 3, 1, 1, 9, 3, 1, 9, 1, 9, 1, 9, 1, 9, 1, 9, 1, 9, 1, 9, 1, 1, 9, 4, 1, 1, 9, 3, 6, 7, 5, 2, 9, 8, 8, 8, 5, 4, 8, 8, 8, 9, 1, 1, 9, 8, 1, 1, 9, 9, 1, 1, 9, 8, 1, 1, 9, 9, 3, 9, 9, 6, 4, 8, 2, 2, 1, 2, 5, 9, 8, 8, 8, 5, 4, 8, 8, 9, 1, 1, 9, 8, 1, 1, 9, 9, 1, 1, 9, 8, 1, 1, 9, 9, 1, 1, 9, 1, 1, 9, 1, 1, 9, 1, 1, 9, 1, 1, 1, 9, 3, 6, 7, 5, 2, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9,	5, 8, 5, 6, 7, 2, 5, 3, 4, 6, 4, 4};	5, 7, 5, 9, 4, 9, 5, 4, 2, 4,	5, 7, 5, 9, 4, 9, 5, 4, 2, 4,
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9, 4, 1, 2, 0, 4, 6, 3, 3, 2, 9, 4, 1, 2, 0, 4, 6, 3, 3, 2, 9, 4, 1, 4, 8, 3, 7, 2, 3, 3, 4, 5, 9, 0, 1, 0, 8, 5, 1, 1, 7, 4, 8, 6, 1, 0, 9, 5, 5, 3, 9, 8, 0, 0, 8, 1, 0, 8, 8, 7, 3, 6, 2, 3, 0, 8, 2, 5, 2, 2, 3, 3, 2, 2, 9, 4, 4, 4, 1, 0, 8, 3, 4, 8, 9, 1, 1, 0, 8, 2, 9, 4, 1, 2, 0, 4, 6, 3, 3, 2, 9, 4, 1, 2, 0, 4, 6, 3, 3, 2, 2, 3, 3, 2, 3, 3, 4, 8, 9, 1, 1, 0, 8, 3, 3, 4, 8, 9, 1, 1, 0, 8, 2, 9, 4, 1, 2, 0, 4, 6, 3, 3, 2, 9, 4, 1, 2, 0, 4, 6, 3, 3, 2, 9, 4, 1, 4, 8, 3, 7, 2, 3, 3, 3, 4, 5, 9, 0, 1, 0, 8, 5, 1, 1, 4, 5, 9, 0, 1, 0, 8, 5, 1, 1, 7, 4, 8, 6, 1, 0, 9, 5, 5, 3, 9, 8, 0, 0, 8, 1, 0, 8, 8, 7, 3, 6, 2, 3, 0, 8, 2, 5, 2, 2, 3, 3, 2, 2, 9, 4, 4, 4, 1, 0, 8, 3, 4, 8, 9, 1, 1, 0, 8, 2, 8, 3, 4, 8, 9, 1, 1, 0, 8, 2,			
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8, 3, 4, 8, 9, 1, 1, 0, 8, 2, 8, 3, 4, 8, 9, 1, 1, 0, 8, 2,			
	0.4.01		- , , , , , , , , , , , , , , , , , ,

-	Test	Expected	Got
		6, 0, 9, 3, 5, 6, 3, 8, 5, 4,	6, 0, 9, 3, 5, 6, 3, 8, 5, 4,
		5, 8, 9, 0, 3, 9, 8, 9, 8, 3,	5, 8, 9, 0, 3, 9, 8, 9, 8, 3,
		5, 4, 5, 4, 3, 8, 0, 3, 4, 5,	5, 4, 5, 4, 3, 8, 0, 3, 4, 5,
		1, 3, 4, 6, 7, 9, 6, 5, 4, 1, 1, 6, 5, 2, 0, 7, 5, 3, 7, 5,	1, 3, 4, 6, 7, 9, 6, 5, 4, 1, 1, 6, 5, 2, 0, 7, 5, 3, 7, 5,
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		6, 9, 5, 3, 9, 2, 7, 6, 8, 5,	6, 9, 5, 3, 9, 2, 7, 6, 8, 5,
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		4, 9, 3, 8, 6, 5, 5, 5, 8, 2,	4, 9, 3, 8, 6, 5, 5, 5, 8, 2,
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	OF CHKH	5, 4, 4, 1, 9, 3, 7, 9, 9, 3, 2, 8, 5, 4, 9, 2, 2, 0, 5, 1,	5, 4, 4, 1, 9, 3, 7, 9, 9, 3, 2, 8, 5, 4, 9, 2, 2, 0, 5, 1,
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	O, /	2, 6, 8, 4, 6, 2, 7, 0, 1, 5,	2, 6, 8, 4, 6, 2, 7, 0, 1, 5,
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	TÀI LIÊ	2, 2, 8, 3, 9, 9, 8, 8, 4, 8,	2, 2, 8, 3, 9, 9, 8, 8, 4, 8,
	- 21	4, 6, 4, 1, 7, 3, 8, 4, 3, 1, 6, 4, 6, 1, 0, 1, 3, 8, 4, 3,	4, 6, 4, 1, 7, 3, 8, 4, 3, 1, 6, 4, 6, 1, 0, 1, 3, 8, 4, 3,
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		7, 8, 4, 4, 9, 7, 4, 0, 8, 3,	7, 8, 4, 4, 9, 7, 4, 0, 8, 3,
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		9, 1, 6, 7, 6, 6, 6, 1, 3, 8, 4, 1, 6, 7, 6, 3, 4, 3, 5, 1,	9, 1, 6, 7, 6, 6, 6, 1, 3, 8, 4, 1, 6, 7, 6, 3, 4, 3, 5, 1,
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	BACH	KHOACNCP.COM	

Test	Expected	Got
	4, 4, 8, 5, 3, 7, 2, 7, 5, 2,	4, 4, 8, 5, 3, 7, 2, 7, 5, 2,
	3, 0, 7, 5, 9, 8, 1, 2, 8, 1,	3, 0, 7, 5, 9, 8, 1, 2, 8, 1,
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	4, 2, 6, 7, 1, 8]	4, 2, 6, 7, 1, 8]



Test	Expected	Got
int arr[] = {2, 2, 6, 2, 6, 9, 8, 0, 5, 7, 5, 2, 0,	[2, 2, 6, 2, 6, 9, 8, 0, 5, 7,	[2, 2, 6, 2, 6, 9, 8, 0, 5, 7,
3, 3, 5, 1, 0, 6, 0, 0, 4, 3, 8, 1, 0, 7, 7, 9, 8,	5, 2, 0, 3, 3, 5, 1, 0, 6, 0,	5, 2, 0, 3, 3, 5, 1, 0, 6, 0,
7, 8, 5, 5, 2, 4, 4, 6, 1, 2, 8, 5, 8, 1, 6, 3, 0,	0, 4, 3, 8, 1, 0, 7, 7, 9, 8,	0, 4, 3, 8, 1, 0, 7, 7, 9, 8,
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8, 4, 2, 2, 6, 0, 7, 8, 6, 7, 9, 9, 0, 5, 6, 1, 4,	6, 8, 5, 5, 7, 7, 7, 7, 0, 0,	6, 8, 5, 5, 7, 7, 7, 7, 0, 0,
9, 9, 0, 3, 2, 6, 5, 6, 1, 7, 8, 8, 9, 0, 0, 2, 6,	6, 6, 6, 2, 7, 0, 9, 8, 7, 2,	6, 6, 6, 2, 7, 0, 9, 8, 7, 2, 9, 3, 0, 0, 4, 6, 2, 5, 1, 3,
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Test	Expected	Got
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5, 6, 1, 7, 3, 9, 0, 9, 5, 9, 5, 6, 2, 0, 7, 4, 0,	4, 4, 2, 6, 5, 4, 2, 0, 0, 2,	4, 4, 2, 6, 5, 4, 2, 0, 0, 2,
1, 6, 7, 3, 2, 7, 0, 6, 3, 1, 4, 3, 4, 3, 9, 9, 6,	7, 8, 8, 7, 9, 7, 9, 8, 8, 2,	7, 8, 8, 7, 9, 7, 9, 8, 8, 2,
0, 7, 9, 4, 3, 8, 1, 5, 4, 3, 2, 3, 1, 9, 9, 2, 1,	6, 0, 9, 0, 2, 6, 1, 9, 2, 9,	6, 0, 9, 0, 2, 6, 1, 9, 2, 9,
6, 9, 8, 1, 6, 2, 8, 4, 6, 8, 6, 5, 6, 9, 4, 1, 2,	2, 5, 8, 6, 8, 0, 1, 5, 0, 6,	2, 5, 8, 6, 8, 0, 1, 5, 0, 6,
1, 2, 2, 3, 4, 0, 7, 1, 0, 7, 9, 1, 2, 9, 6, 1, 6,	9, 7, 7, 2, 1, 5, 6, 1, 7, 0,	9, 7, 7, 2, 1, 5, 6, 1, 7, 0,
9, 3, 2, 1, 9, 7, 8, 6, 5, 2, 0, 3, 3, 5, 3, 5, 5,	0, 7, 0, 0, 2, 8, 3, 3, 2, 9,	0, 7, 0, 0, 2, 8, 3, 3, 2, 9,
9, 5, 7, 6, 1, 5, 1, 0, 7, 1, 8, 6, 7, 7, 8, 3, 9,	8, 9, 8, 9, 9, 1, 7, 6, 2, 5,	8, 9, 8, 9, 9, 1, 7, 6, 2, 5,
0, 0, 6, 0, 0, 6, 8, 6, 9, 6, 1, 3, 1, 7, 5, 3, 5,	1, 2, 5, 7, 0, 8, 2, 8, 7, 7,	1, 2, 5, 7, 0, 8, 2, 8, 7, 7,
	6, 1, 2, 8, 2, 5, 8, 0, 5, 7,	6, 1, 2, 8, 2, 5, 8, 0, 5, 7,
8, 3, 5, 8, 6, 1, 5, 6, 2, 2, 4, 6, 0, 2, 6, 7, 8,		0, 7, 0, 2, 5, 5, 0, 3, 1, 8,
8, 3, 5, 8, 6, 1, 5, 6, 2, 2, 4, 6, 0, 2, 6, 7, 8, 0, 5, 9, 5, 1, 1, 2, 3, 4, 7, 5, 7, 0, 8, 2, 4, 4,	0, 7, 0, 2, 5, 5, 0, 3, 1, 8,	0, 1, 0, 2, 3, 3, 0, 3, 2, 0,
	0, 7, 0, 2, 5, 5, 0, 3, 1, 8, 5, 7, 6, 8, 0, 0, 5, 1, 9, 0,	5, 7, 6, 8, 0, 0, 5, 1, 9, 0,
0, 5, 9, 5, 1, 1, 2, 3, 4, 7, 5, 7, 0, 8, 2, 4, 4,		

Test	Expected	Got
3, 0, 4, 3, 7, 3, 5, 7, 6, 6, 0, 8, 2, 7, 1, 3, 4,	7, 8, 4, 5, 7, 6, 4, 9, 7, 6,	7, 8, 4, 5, 7, 6, 4, 9, 7, 6,
6, 8, 8, 2, 8, 4, 7, 6, 2, 0, 0, 0, 7, 6, 9, 2, 4,	1, 1, 1, 6, 0, 1, 0, 7, 5, 1,	1, 1, 1, 6, 0, 1, 0, 7, 5, 1,
7, 3, 1, 1, 7, 0, 3, 4, 5, 6, 9, 0, 5, 5, 9, 5, 1, 1, 3, 5, 5, 0, 9, 9, 6, 4, 7, 3, 9, 3, 5, 1, 2, 1,	9, 9, 2, 7, 4, 9, 9, 0, 6, 3, 1,snip 2, 7, 3, 3, 1,	9, 9, 2, 7, 4, 9, 9, 0, 6, 3, 1,snip 2, 7, 3, 3, 1,
0, 8, 1, 7, 9, 8, 8, 3, 7, 0, 8, 0, 8, 2, 9, 9, 1,	3, 7, 2, 1, 8, 4, 2, 6, 7, 2,	3, 7, 2, 1, 8, 4, 2, 6, 7, 2,
0, 8, 2, 9, 7, 2, 1, 1, 7, 6, 1, 4, 6, 2, 0, 7, 1,	5, 3, 8, 6, 8, 4, 0, 7, 5, 6,	5, 3, 8, 6, 8, 4, 0, 7, 5, 6,
7, 7, 4, 8, 8, 0, 8, 7, 5, 7, 0, 3, 1, 5, 3, 8, 8,	1, 4, 5, 2, 6, 5, 2, 9, 1, 5,	1, 4, 5, 2, 6, 5, 2, 9, 1, 5,
5, 7, 6, 5, 0, 1, 7, 0, 0, 9, 6, 4, 7, 2, 2, 4, 2, 5, 7, 8, 9, 3, 0, 1, 3, 9, 7, 4, 7, 9, 7, 0, 6, 1,	1, 3, 8, 9, 0, 7, 7, 4, 9, 4, 4, 7, 0, 0, 9, 0, 7, 9, 5, 4,	1, 3, 8, 9, 0, 7, 7, 4, 9, 4, 4, 7, 0, 0, 9, 0, 7, 9, 5, 4,
2, 9, 8, 3, 9, 5, 5, 7, 9, 7, 0, 0, 3, 6, 4, 7, 0,	8, 5, 9, 1, 8, 8, 9, 7, 1, 6,	8, 5, 9, 1, 8, 8, 9, 7, 1, 6,
1, 3, 4, 0, 5, 0, 2, 8, 7, 9, 6, 1, 0, 8, 2, 4, 7,	2, 8, 9, 0, 4, 1, 8, 1, 3, 3,	2, 8, 9, 0, 4, 1, 8, 1, 3, 3,
2, 0, 7, 0, 8, 4, 1, 7, 6, 8, 9, 7, 2, 4, 9, 1, 3,	1, 6, 4, 7, 0, 0, 3, 2, 5, 9,	1, 6, 4, 7, 0, 0, 3, 2, 5, 9,
7, 9, 8, 6, 0, 4, 3, 2, 6, 9, 3, 0, 8, 0, 0, 2, 4,	0, 5, 9, 7, 1, 1, 9, 6, 3, 4,	0, 5, 9, 7, 1, 1, 9, 6, 3, 4,
4, 9, 3, 4, 9, 1, 4, 2, 2, 9, 5, 7, 8, 9, 7, 0, 9, 5, 4, 7, 2, 1, 3, 3, 2, 7, 6, 0, 0, 1, 2, 7, 3, 2,	3, 6, 7, 4, 4, 7, 4, 7, 8, 6, 5, 5, 1, 5, 9, 8, 4, 6, 9, 6,	3, 6, 7, 4, 4, 7, 4, 7, 8, 6, 5, 5, 1, 5, 9, 8, 4, 6, 9, 6,
8, 7, 1, 0, 6, 8, 8, 8, 2, 8, 9, 5, 6, 5, 0, 5, 9,	8, 5, 0, 8, 2, 9, 1, 3, 7, 9,	8, 5, 0, 8, 2, 9, 1, 3, 7, 9,
7, 2, 2, 3, 9, 3, 1, 8, 6, 9, 1, 1, 4, 9, 0, 9, 1,	5, 2, 1, 8, 0, 5, 9, 4, 9, 5,	5, 2, 1, 8, 0, 5, 9, 4, 9, 5,
3, 1, 9, 1, 0, 5, 3, 6, 9, 0, 3, 6, 5, 6, 1, 0, 7,	6, 3, 2, 8, 2, 8, 5, 8, 8, 7,	6, 3, 2, 8, 2, 8, 5, 8, 8, 7,
4, 2, 3, 3, 1, 4, 7, 3, 8, 2, 5, 6, 8, 4, 8, 6, 7,	1, 4, 4, 6, 2, 6, 1, 7, 0, 4,	1, 4, 4, 6, 2, 6, 1, 7, 0, 4,
4, 8, 3, 7, 4, 7, 1, 4, 0, 3, 8, 1, 0, 2, 3, 4, 9,	9, 9, 6, 3, 1, 3, 3, 3, 5, 8,	9, 9, 6, 3, 1, 3, 3, 3, 5, 8,
1, 5, 0, 6, 3, 4, 9, 4, 3, 3, 6, 3, 6, 8, 1, 9, 7, 4, 5, 7, 4, 9, 5, 0, 9, 7, 4, 1, 8, 0, 7, 5, 0, 2,	7, 2, 5, 1, 3, 8, 2, 8, 1, 5, 2, 0, 6, 6, 5, 5, 4, 5, 7, 9,	7, 2, 5, 1, 3, 8, 2, 8, 1, 5, 2, 0, 6, 6, 5, 5, 4, 5, 7, 9,
7, 8, 0, 9, 4, 5, 2, 0, 9, 6, 4, 7, 0};	3, 5, 3, 1, 6, 9, 0, 9, 5, 8,	3, 5, 3, 1, 6, 9, 0, 9, 5, 8,
int k = 990;	8, 4, 6, 0, 9, 4, 0, 8, 1, 2,	8, 4, 6, 0, 9, 4, 0, 8, 1, 2,
LLNode* head = LLNode::createWithIterators(arr, arr	3, 9, 9, 6, 9, 2, 8, 6, 5, 4,	3, 9, 9, 6, 9, 2, 8, 6, 5, 4,
+ sizeof(arr) / sizeof(int));	9, 2, 4, 2, 3, 1, 8, 6, 8, 3,	9, 2, 4, 2, 3, 1, 8, 6, 8, 3,
LLNode::printList(head);	3, 5, 4, 7, 1, 1, 2, 7, 5, 8,	3, 5, 4, 7, 1, 1, 2, 7, 5, 8,
<pre>cout << "\n"; LLNode* newhead = rotateLinkedList(head, k);</pre>	7, 7, 2, 3, 5, 3, 4, 7, 2, 8, 5, 6, 9, 7, 1, 4, 0, 0, 3, 6,	7, 7, 2, 3, 5, 3, 4, 7, 2, 8, 5, 6, 9, 7, 1, 4, 0, 0, 3, 6,
LLNode::printList(newhead);	3, 0, 4, 4, 0, 4, 3, 7, 1, 8,	3, 0, 4, 4, 0, 4, 3, 7, 1, 8,
~	5, 1, 3, 0, 9, 0, 2, 2, 5, 3,	5, 1, 3, 0, 9, 0, 2, 2, 5, 3,
	3, 8, 7, 9, 3, 9, 5, 9, 0, 7,	3, 8, 7, 9, 3, 9, 5, 9, 0, 7,
	7, 0, 2, 9, 8, 4, 0, 6, 0, 4,	7, 0, 2, 9, 8, 4, 0, 6, 0, 4,
	2, 3, 3, 4, 9, 7, 2, 8, 3, 1, 9, 2, 7, 9, 8, 7, 5, 7, 1, 9,	2, 3, 3, 4, 9, 7, 2, 8, 3, 1, 9, 2, 7, 9, 8, 7, 5, 7, 1, 9,
	3, 9, 4, 2, 9, 1, 1, 0, 4, 6,	3, 9, 4, 2, 9, 1, 1, 0, 4, 6,
TÁIIIF	3, 8, 6, 9, 3, 9, 5, 1, 8, 0,	3, 8, 6, 9, 3, 9, 5, 1, 8, 0,
1741 =15	6, 7, 6, 4, 7, 7, 6, 7, 4, 3,	6, 7, 6, 4, 7, 7, 6, 7, 4, 3,
вот н	8, 4, 4, 3, 3, 6, 8, 3, 7, 4,	8, 4, 4, 3, 3, 6, 8, 3, 7, 4,
	5, 4, 7, 7, 5, 1, 6, 8, 2, 8,	5, 4, 7, 7, 5, 1, 6, 8, 2, 8, 0, 8, 0, 8, 8, 7, 3, 6, 5, 2,
	0, 8, 0, 8, 8, 7, 3, 6, 5, 2, 4, 3, 9, 8, 7, 6, 3, 0, 4, 4,	4, 3, 9, 8, 7, 6, 3, 0, 4, 4,
	6, 2, 3, 5, 6, 0, 9, 2, 1, 9,	6, 2, 3, 5, 6, 0, 9, 2, 1, 9,
	4, 8, 9, 8, 9, 1, 1, 5, 7, 8,	4, 8, 9, 8, 9, 1, 1, 5, 7, 8,
	0, 0, 1, 1, 2, 7, 8, 9, 7, 2,	0, 0, 1, 1, 2, 7, 8, 9, 7, 2,
	3, 2, 8, 9, 5, 1, 8, 9, 9, 5, 2, 2, 0, 6, 5, 6, 9, 5, 2, 6,	3, 2, 8, 9, 5, 1, 8, 9, 9, 5,
	2, 3, 7, 4, 2, 6, 1, 9, 8, 0,	2, 2, 0, 6, 5, 6, 9, 5, 2, 6, 2, 3, 7, 4, 2, 6, 1, 9, 8, 0,
	0, 4, 7, 2, 1, 6, 1, 8, 6, 7,	0, 4, 7, 2, 1, 6, 1, 8, 6, 7,
	1, 2, 6, 1, 4, 1, 6, 2, 1, 9,	1, 2, 6, 1, 4, 1, 6, 2, 1, 9,
	5, 0, 0, 4, 6, 2, 5, 3, 3, 0,	5, 0, 0, 4, 6, 2, 5, 3, 3, 0,
	5, 0, 2, 2, 7, 6, 1, 1, 3, 9,	5, 0, 2, 2, 7, 6, 1, 1, 3, 9,
	5, 6, 0, 3, 4, 2, 8, 3, 7, 2, 9, 6, 1, 8, 3, 1, 3, 8, 5, 1,	5, 6, 0, 3, 4, 2, 8, 3, 7, 2, 9, 6, 1, 8, 3, 1, 3, 8, 5, 1,
	9, 0, 0, 4, 3, 4, 6, 4, 6, 7,	9, 0, 0, 4, 3, 4, 6, 4, 6, 7,
	8, 5, 2, 5, 6, 1, 6, 8, 5, 2,	8, 5, 2, 5, 6, 1, 6, 8, 5, 2,
	1, 1, 0, 4, 7, 0, 4, 9, 1, 4,	1, 1, 0, 4, 7, 0, 4, 9, 1, 4,
	2, 1, 4, 4, 5, 7, 2, 1, 2, 5,	2, 1, 4, 4, 5, 7, 2, 1, 2, 5,
	3, 8, 0, 6, 6, 0, 5, 2, 7, 5, 7, 5, 7, 9, 0, 8, 3, 3, 4, 0,	3, 8, 0, 6, 6, 0, 5, 2, 7, 5, 7, 5, 7, 9, 0, 8, 3, 3, 4, 0,
	3, 8, 4, 1, 4, 0, 8, 4, 8, 3,	3, 8, 4, 1, 4, 0, 8, 4, 8, 3,
	1, 2, 5, 6, 8, 2, 9, 2, 6, 5,	1, 2, 5, 6, 8, 2, 9, 2, 6, 5,
	5, 5, 1, 0, 5, 1, 9, 6, 2, 2,	5, 5, 1, 0, 5, 1, 9, 6, 2, 2,
	3, 0, 7, 6, 8, 7, 7, 8, 2, 0,	3, 0, 7, 6, 8, 7, 7, 8, 2, 0,
	9, 3, 1, 5, 3, 1, 4, 6, 7, 5,	9, 3, 1, 5, 3, 1, 4, 6, 7, 5,
BACH	KHOACNCP.COM	ı İ

Test	Expected	Got
	9, 9, 3, 8, 5, 2, 3, 4, 0, 5,	9, 9, 3, 8, 5, 2, 3, 4, 0, 5,
	9, 1, 7, 2, 9, 8, 2, 0, 7, 0, 9, 0, 2, 6, 6, 8, 5, 5, 6, 0,	9, 1, 7, 2, 9, 8, 2, 0, 7, 0, 9, 0, 2, 6, 6, 8, 5, 5, 6, 0,
	1, 8, 0, 9, 2, 4, 9, 8, 3, 6,	1, 8, 0, 9, 2, 4, 9, 8, 3, 6,
	3, 9, 2, 2, 6, 5, 7, 3, 5, 0,	3, 9, 2, 2, 6, 5, 7, 3, 5, 0,
	6, 6, 8, 4, 6, 7, 8, 6, 9, 4,	6, 6, 8, 4, 6, 7, 8, 6, 9, 4,
	1, 3, 2, 1, 8, 0, 0, 7, 2, 1,	1, 3, 2, 1, 8, 0, 0, 7, 2, 1,
	5, 3, 4, 3, 2, 4, 1, 3, 0, 3, 9, 8, 6, 3, 5, 5, 9, 9, 3, 1,	5, 3, 4, 3, 2, 4, 1, 3, 0, 3, 9, 8, 6, 3, 5, 5, 9, 9, 3, 1,
	2, 4, 7, 4, 0, 3, 7, 8, 4, 3,	2, 4, 7, 4, 0, 3, 7, 8, 4, 3,
	4, 4, 3, 0, 5, 8, 0, 8, 2, 6,	4, 4, 3, 0, 5, 8, 0, 8, 2, 6,
	0, 4, 0, 3, 4, 4, 8, 1, 2, 0,	0, 4, 0, 3, 4, 4, 8, 1, 2, 0,
	0, 0, 1, 9, 2, 4, 6, 6, 9, 4, 8, 9, 5, 2, 2, 4, 9, 8, 6, 8,	0, 0, 1, 9, 2, 4, 6, 6, 9, 4, 8, 9, 5, 2, 2, 4, 9, 8, 6, 8,
	5, 9, 5, 8, 1, 0, 5, 1, 4, 4,	5, 9, 5, 8, 1, 0, 5, 1, 4, 4,
	6, 3, 6, 5, 2, 6, 2, 0, 7, 4,	6, 3, 6, 5, 2, 6, 2, 0, 7, 4,
	1, 2, 7, 3, 4, 4, 9, 3, 9, 2,	1, 2, 7, 3, 4, 4, 9, 3, 9, 2,
	9, 1, 3, 0, 4, 1, 0, 2, 4, 9, 3, 3, 1, 3, 0, 8, 8, 7, 4, 5,	9, 1, 3, 0, 4, 1, 0, 2, 4, 9, 3, 3, 1, 3, 0, 8, 8, 7, 4, 5,
	9, 9, 9, 6, 6, 4, 4, 2, 5, 0,	9, 9, 9, 6, 6, 4, 4, 2, 5, 0,
	1, 0, 8, 9, 0, 4, 8, 5, 6, 8,	1, 0, 8, 9, 0, 4, 8, 5, 6, 8,
	1, 0, 9, 1, 8, 2, 6, 1, 0, 9,	1, 0, 9, 1, 8, 2, 6, 1, 0, 9,
	9, 2, 5, 9, 4, 1, 7, 5, 6, 5, 4, 3, 9, 3, 9, 4, 1, 6, 7, 6,	9, 2, 5, 9, 4, 1, 7, 5, 6, 5, 4, 3, 9, 3, 9, 4, 1, 6, 7, 6,
	3, 1, 6, 6, 5, 2, 5, 9, 7, 6,	3, 1, 6, 6, 5, 2, 5, 9, 7, 6,
	9, 3, 3, 1, 2, 5, 0, 2, 5, 6,	9, 3, 3, 1, 2, 5, 0, 2, 5, 6,
	7, 2, 3, 0, 7, 9, 0, 2, 2, 9,	7, 2, 3, 0, 7, 9, 0, 2, 2, 9,
<u> </u>	7, 3, 3, 3, 3, 4, 1, 6, 7, 6, 3, 1, 6, 6, 5, 2, 5, 9, 7, 6, 9, 3, 3, 1, 2, 5, 0, 2, 5, 6, 7, 2, 3, 0, 7, 9, 0, 2, 2, 9, 5, 9, 1, 9, 6, 1, 7, 4, 1, 6, 7, 0, 5, 9, 8, 1, 2, 2, 5, 6, 3, 3, 4, 8, 8, 1, 0, 5, 2, 7, 1, 6, 7, 3, 1, 1, 8, 9, 7, 6	5, 9, 1, 9, 6, 1, 7, 4, 1, 6, 7, 0, 5, 9, 8, 1, 2, 2, 5, 6,
on on	3, 3, 4, 8, 8, 1, 0, 5, 2, 7,	3, 3, 4, 8, 8, 1, 0, 5, 2, 7,
7	1, 6, 7, 3, 1, 1, 8, 9, 7, 6,	1, 6, 7, 3, 1, 1, 8, 9, 7, 6,
	3, 3, 4, 0, 0, 9, 2, 6, 2, 4,	3, 3, 4, 0, 0, 9, 2, 6, 2, 4,
	2, 2, 1, 3, 6, 6, 6, 8, 5, 8,	2, 2, 1, 3, 6, 6, 6, 8, 5, 8, 8, 1, 3, 6, 9, 6, 5, 2, 3, 0,
	8, 1, 3, 6, 9, 6, 5, 2, 3, 0, 2, 2, 1, 0, 1, 9, 1, 4, 4, 9,	2, 2, 1, 0, 1, 9, 1, 4, 4, 9,
	3 2 3 4 0 3 4 5 8 3	3, 2, 3, 4, 0, 3, 4, 5, 8, 3,
T À	6, 3, 5, 6, 8, 4, 1, 1, 5, 1,	6, 3, 5, 6, 8, 4, 1, 1, 5, 1,
	2, 8, 2, 5, 0, 2, 8, 9, 1, 2, 5, 4, 9, 2, 7, 0, 5, 1, 5, 6,	2, 8, 2, 5, 0, 2, 8, 9, 1, 2, 5, 4, 9, 2, 7, 0, 5, 1, 5, 6,
	2, 2, 9, 3, 9, 3, 9, 6, 9, 8,	2, 2, 9, 3, 9, 3, 9, 6, 9, 8,
	3, 3, 1, 8, 8, 5, 4, 3, 5, 7,	3, 3, 1, 8, 8, 5, 4, 3, 5, 7,
	5, 8, 5, 5, 8, 0, 2, 5, 4, 0,	5, 8, 5, 5, 8, 0, 2, 5, 4, 0,
	7, 8, 9, 0, 2, 6, 4, 4, 2, 3, 8, 3, 0, 3, 8, 4, 2, 6, 6, 6,	7, 8, 9, 0, 2, 6, 4, 4, 2, 3, 8, 3, 0, 3, 8, 4, 2, 6, 6, 6,
	4, 2, 3, 0, 2, 6, 9, 2, 8, 3,	4, 2, 3, 0, 2, 6, 9, 2, 8, 3,
	8, 0, 6, 8, 3, 5, 0, 9, 6, 0,	8, 0, 6, 8, 3, 5, 0, 9, 6, 0,
	7, 2, 5, 0, 3, 2, 8, 8, 2, 5,	7, 2, 5, 0, 3, 2, 8, 8, 2, 5,
	5, 3, 6, 9, 4, 9, 2, 2, 9, 6, 6, 7, 5, 7, 4, 6, 9, 8, 9, 7,	5, 3, 6, 9, 4, 9, 2, 2, 9, 6, 6, 7, 5, 7, 4, 6, 9, 8, 9, 7,
	9, 2, 7, 0, 4, 9, 0, 6, 2, 8,	9, 2, 7, 0, 4, 9, 0, 6, 2, 8,
	1, 3, 0, 3, 4, 7, 0, 7, 2, 1,	1, 3, 0, 3, 4, 7, 0, 7, 2, 1,
	7, 4, 2, 0, 6, 5, 6, 3, 6, 6,	7, 4, 2, 0, 6, 5, 6, 3, 6, 6,
	9, 1, 3, 0, 8, 4, 9, 7, 1, 6, 8, 4, 9, 8, 3, 4, 0, 2, 2, 4,	9, 1, 3, 0, 8, 4, 9, 7, 1, 6, 8, 4, 9, 8, 3, 4, 0, 2, 2, 4,
	6, 2, 7, 9, 0, 3, 8, 0, 6, 0,	6, 2, 7, 9, 0, 3, 8, 0, 6, 0,
	6, 7, 7, 9, 6, 0, 4, 7, 8, 4,	6, 7, 7, 9, 6, 0, 4, 7, 8, 4,
	4, 2, 7, 0, 0, 8, 0, 8, 8, 5,	4, 2, 7, 0, 0, 8, 0, 8, 8, 5,
	7, 6, 2, 8, 5, 5, 3, 7, 1, 2, 8, 8, 4, 1, 8, 1, 8, 7, 8, 4,	7, 6, 2, 8, 5, 5, 3, 7, 1, 2, 8, 8, 4, 1, 8, 1, 8, 7, 8, 4,
	0, 1, 6, 3, 0, 2, 3, 6, 0, 8,	0, 1, 6, 3, 0, 2, 3, 6, 0, 8,
	2, 0, 7, 8, 7, 1, 3, 3, 5, 0,	2, 0, 7, 8, 7, 1, 3, 3, 5, 0,
	0, 1, 5, 2, 7, 5, 2, 5, 1, 6,	0, 1, 5, 2, 7, 5, 2, 5, 1, 6,
	4, 9, 9, 7, 2, 1, 3, 3, 3, 2, 2, 5, 9, 0, 7, 0, 0, 1, 0, 6,	4, 9, 9, 7, 2, 1, 3, 3, 3, 2, 2, 5, 9, 0, 7, 0, 0, 1, 0, 6,
	2, 1, 1, 9, 4, 3, 3, 4, 9, 9,	2, 1, 1, 9, 4, 3, 3, 4, 9, 9,
	BACH'KHOACNCP.COM	

Expected	Got
5, 7, 2, 3, 7, 8, 4, 2, 4, 0 0, 7, 5, 7, 1, 9, 5, 7, 7, 6	
0, 6, 7, 8, 5, 9, 9, 4, 9, 2	0, 6, 7, 8, 5, 9, 9, 4, 9, 2,
6, 8, 4, 1, 1, 8, 1, 0, 2, 4 6, 3, 0, 8, 9, 1, 6, 6, 2, 3	
6, 6, 3, 9, 8, 7, 5, 5, 8, 3	6, 6, 3, 9, 8, 7, 5, 5, 8, 3, 8, 4, 1, 6, 6, 6]
	5, 7, 2, 3, 7, 8, 4, 2, 4, 0 0, 7, 5, 7, 1, 9, 5, 7, 7, 6 0, 6, 7, 8, 5, 9, 9, 4, 9, 2 6, 8, 4, 1, 1, 8, 1, 0, 2, 4 6, 3, 0, 8, 9, 1, 6, 6, 2, 3



Test	Expected	Got	
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Test	Expected	Got
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2, 6, 3, 2, 8, 1, 1, 7, 6, 5, 3, 5, 7, 5, 6, 6, 7,	9, 5, 2, 6, 0, 4, 5, 4, 0, 5,	9, 5, 2, 6, 0, 4, 5, 4, 0, 5,
9, 8, 4, 8, 4, 0, 1, 1, 7, 0, 5, 5, 7, 3, 0, 9, 3,	5, 4, 6, 6, 3, 8, 2, 7, 8, 0,	5, 4, 6, 6, 3, 8, 2, 7, 8, 0,
3, 5, 9, 7, 1, 1, 3, 9, 6, 7, 8, 4, 7, 4, 5, 5, 8,	2, 5, 4, 5, 6, 3, 3, 6, 8, 1,	2, 5, 4, 5, 6, 3, 3, 6, 8, 1,
0, 6, 2, 7, 4, 6, 0, 3, 0, 4, 6, 5, 8, 0, 3, 4, 7,	0, 6, 1, 5, 7, 2, 9, 3, 1, 8,	0, 6, 1, 5, 7, 2, 9, 3, 1, 8,
9, 3, 8, 5, 2, 1, 6, 0, 9, 0, 4, 7, 9, 2, 0, 7, 2,	3, 0, 8, 8, 3, 2, 1, 7, 5, 5,	3, 0, 8, 8, 3, 2, 1, 7, 5, 5,
5, 6, 4, 9, 4, 1, 0, 8, 5, 6, 2, 0, 8, 0, 1, 4, 9,	6, 0, 6, 8, 2, 6, 9, 7, 5, 1,	6, 0, 6, 8, 2, 6, 9, 7, 5, 1,
0, 2, 3, 8, 3, 2, 4, 3, 0, 1, 0, 5, 3, 3, 2, 2, 8,	1, 6, 0, 6, 2, 1, 4, 5, 8, 7,	1, 6, 0, 6, 2, 1, 4, 5, 8, 7,
6, 0, 1, 1, 3, 1, 6, 1, 0, 3, 0, 6, 3, 8, 1, 0, 1,	4, 3, 4, 6, 7, 9, 9, 8, 2, 5,	4, 3, 4, 6, 7, 9, 9, 8, 2, 5,
0, 2, 2, 7, 1, 1, 1, 4, 6, 2, 2, 0, 8, 6, 6, 5, 9,	9, 6, 5, 0, 3, 2, 5, 7, 7, 4,	9, 6, 5, 0, 3, 2, 5, 7, 7, 4,
1, 0, 3, 1, 8, 2, 9, 2, 0, 8, 5, 2, 2, 6, 1, 1, 5,	0, 8, 3, 4, 3, 2, 3, 0, 5, 6,	0, 8, 3, 4, 3, 2, 3, 0, 5, 6,
3, 1, 0, 3, 3, 1, 8, 7, 8, 4, 1, 0, 1, 4, 2, 6, 5,	0, 2, 5, 7, 0, 4, 2, 3, 0, 9,	0, 2, 5, 7, 0, 4, 2, 3, 0, 9,
6, 9, 1, 8, 2, 1, 8, 6, 0, 0, 2, 5, 6, 6, 6, 5, 6,	1, 9, 3, 7, 8, 4, 7, 0, 9, 8,	1, 9, 3, 7, 8, 4, 7, 0, 9, 8,
0, 2, 3, 2, 0, 4, 5, 3, 8, 5, 2, 1, 1, 1, 7, 1, 3,	7, 3, 7, 5, 1, 7, 7, 4, 4, 1,	7, 3, 7, 5, 1, 7, 7, 4, 4, 1,
6, 7, 6, 0, 9, 3, 5, 3, 6, 5, 4, 8, 9, 9, 0, 9, 6,	7, 8, 4, 0, 6, 4, 9, 5, 4, 5,	7, 8, 4, 0, 6, 4, 9, 5, 4, 5,
8, 9, 6, 2, 6, 2, 3, 5, 0, 7, 3, 5, 1, 8, 6, 9, 4,	3, 7, 3, 3, 7, 2, 1, 6, 3, 4,	3, 7, 3, 3, 7, 2, 1, 6, 3, 4,
5, 9, 6, 8, 6, 1, 2, 0, 6, 5, 1, 0, 8, 5, 5, 6, 6,	6, 3, 1, 5, 9, 7, 3, 6, 2, 0,	6, 3, 1, 5, 9, 7, 3, 6, 2, 0,
8, 5, 0, 4, 5, 4, 0, 5, 6, 4, 0, 5, 5, 0, 1, 1, 6,	9, 7, 0, 0, 3, 1, 5, 6, 3, 8,	9, 7, 0, 0, 3, 1, 5, 6, 3, 8,
2, 9, 6, 1, 4, 0, 9, 8, 6, 7, 3, 0, 3, 7, 2, 8, 5,	2, 1, 6, 3, 4, 8, 9, 2, 3, 5,	2, 1, 6, 3, 4, 8, 9, 2, 3, 5,
6, 0, 8, 4, 2, 9, 9, 4, 8, 7, 8, 4, 7, 1, 3, 7, 0,	9, 1, 4, 6, 9, 5, 8, 6, 6, 3,	9, 1, 4, 6, 9, 5, 8, 6, 6, 3,
8, 3, 9, 3, 1, 0, 8, 7, 8, 4, 5, 2, 7, 4, 9, 9, 6,	4, 7, 2, 3, 7, 0, 2, 2, 7, 6,	4, 7, 2, 3, 7, 0, 2, 2, 7, 6,
0, 0, 9, 2, 3, 2, 2, 3, 3, 5, 7, 6, 8, 7, 6, 0, 1,	8, 9, 9, 7, 2, 0, 9, 0, 3, 9,	8, 9, 9, 7, 2, 0, 9, 0, 3, 9,
-, -, -, -, -, -, -, -, -, -, -, -, -, -	-, -, -, ., -, 0, 0, 0, 0, 0,	
	6, 5, 9, 4, 3, 6, 8, 4, 3, 1.	6, 5, 9, 4, 3, 6, 8, 4, 3, 1,
3, 6, 1, 3, 6, 5, 1, 7, 1, 7, 6, 3, 6, 8, 0, 5, 4,	6, 5, 9, 4, 3, 6, 8, 4, 3, 1, 0, 7, 2, 7, 3, 9, 3, 2, 0, 1,	6, 5, 9, 4, 3, 6, 8, 4, 3, 1, 0, 7, 2, 7, 3, 9, 3, 2, 0, 1,
	6, 5, 9, 4, 3, 6, 8, 4, 3, 1, 0, 7, 2, 7, 3, 9, 3, 2, 0, 1, 9, 2, 3, 9, 1, 3, 3, 6, 5, 6,	6, 5, 9, 4, 3, 6, 8, 4, 3, 1, 0, 7, 2, 7, 3, 9, 3, 2, 0, 1, 9, 2, 3, 9, 1, 3, 3, 6, 5, 6,

Test	Expected	Got
5, 0, 4, 0, 6, 6, 0, 1, 5, 0, 2, 4, 6, 8, 9, 7, 9,	2, 8, 7, 0, 1, 4, 4, 8, 9, 7,	2, 8, 7, 0, 1, 4, 4, 8, 9, 7,
4, 3, 9, 3, 6, 9, 3, 7, 2, 3, 2, 5, 8, 8, 0, 5, 2,	4, 1, 1, 9, 4, 1, 0, 9, 5, 8,	4, 1, 1, 9, 4, 1, 0, 9, 5, 8,
4, 2, 9, 2, 6, 4, 4, 1, 2, 1, 6, 7, 3, 7, 1, 7, 8,	6, 6, 9, 1, 5, 6, 0, 8, 0, 3,	6, 6, 9, 1, 5, 6, 0, 8, 0, 3,
9, 7, 6, 2, 8, 7, 8, 3, 2, 6, 3, 7, 0, 2, 5, 5, 1,	3,snip 3, 0, 7, 6, 6,	3,snip 3, 0, 7, 6, 6,
4, 1, 6, 2, 9, 5, 9, 4, 3, 2, 8, 7, 4, 8, 5, 1, 2,	4, 1, 7, 5, 1, 2, 9, 2, 6, 3,	4, 1, 7, 5, 1, 2, 9, 2, 6, 3,
9, 5, 0, 7, 3, 1, 7, 0, 8, 3, 6, 5, 8, 5, 2, 7, 5,	8, 7, 6, 7, 2, 9, 1, 3, 0, 2,	8, 7, 6, 7, 2, 9, 1, 3, 0, 2,
0, 3, 0, 7, 3, 0, 6, 1, 5, 5, 5, 1, 5, 8, 2, 3, 2,	5, 8, 1, 1, 8, 9, 9, 7, 5, 9,	5, 8, 1, 1, 8, 9, 9, 7, 5, 9,
, 6, 0, 1, 5, 1, 2, 2, 3, 6, 0, 4, 1, 9, 1, 4, 1, , 6, 4, 6, 6, 5, 7, 5, 4, 1, 1, 0, 4, 7, 6, 1, 6,	9, 4, 7, 5, 1, 5, 2, 0, 0, 5,	9, 4, 7, 5, 1, 5, 2, 0, 0, 5,
1, 9, 6, 3, 2, 1, 5, 1, 0, 2, 8, 6, 6, 6, 2, 3, 5,	9, 8, 0, 4, 1, 1, 1, 6, 7, 5, 6, 3, 4, 0, 5, 9, 8, 4, 0, 9,	9, 8, 0, 4, 1, 1, 1, 6, 7, 5, 6, 3, 4, 0, 5, 9, 8, 4, 0, 9,
, 6, 7, 1, 9, 9, 2, 2, 6, 5, 8, 0, 4, 3, 1, 9, 6,	8, 8, 8, 2, 3, 7, 5, 5, 5, 5,	8, 8, 8, 2, 3, 7, 5, 5, 5, 5,
, 7, 4, 0, 3, 3, 7, 1, 3, 0, 2, 9, 1, 5, 7, 7, 6,	7, 2, 6, 1, 0, 2, 3, 1, 1, 9,	7, 2, 6, 1, 0, 2, 3, 1, 1, 9,
, 8, 4, 5, 7, 5, 5, 5, 4, 9, 7, 2, 6, 6, 5, 3, 2,	5, 1, 4, 5, 9, 1, 9, 6, 5, 1,	5, 1, 4, 5, 9, 1, 9, 6, 5, 1,
, 1, 9, 8, 9, 1, 6, 7, 8, 4, 6, 1, 7, 5, 1, 9, 3,	7, 4, 1, 3, 0, 7, 6, 6, 3, 8,	7, 4, 1, 3, 0, 7, 6, 6, 3, 8,
, 5, 1, 1, 4, 2, 5, 1, 5, 2, 7, 4, 7, 9, 8, 9, 2,	8, 9, 3, 8, 6, 5, 4, 1, 7, 3,	8, 9, 3, 8, 6, 5, 4, 1, 7, 3,
, 2, 9, 9, 6, 8, 4, 0, 9, 5, 6, 0, 8, 7, 1, 3, 1,	5, 8, 0, 9, 8, 5, 3, 2, 6, 4,	5, 8, 0, 9, 8, 5, 3, 2, 6, 4,
4, 1, 7, 3, 5, 2, 7, 2, 4, 2, 4, 4, 3, 7, 0, 8, 2,	4, 1, 6, 3, 1, 5, 9, 9, 7, 9,	4, 1, 6, 3, 1, 5, 9, 9, 7, 9,
, 2, 0, 5, 6, 3, 6, 9, 6, 4, 7, 1, 7, 2, 1, 7, 6,	4, 4, 2, 8, 3, 6, 0, 9, 8, 5,	4, 4, 2, 8, 3, 6, 0, 9, 8, 5,
7, 0, 1, 6, 8, 6, 5, 1, 6, 0, 8, 5, 7, 4, 9, 5, 9,	1, 2, 3, 3, 7, 5, 7, 0, 1, 2,	1, 2, 3, 3, 7, 5, 7, 0, 1, 2,
2, 6, 4, 9, 3, 4, 4, 6, 7, 6, 6, 6, 5, 0, 4, 9, 4,	8, 3, 4, 4, 9, 3, 0, 2, 7, 3,	8, 3, 4, 4, 9, 3, 0, 2, 7, 3,
1, 9, 2, 6, 3, 0, 7, 6, 5, 6, 8, 8, 7, 6, 4, 5, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	2, 6, 4, 5, 3, 4, 9, 7, 1, 5,	2, 6, 4, 5, 3, 4, 9, 7, 1, 5,
3, 1, 4, 4, 3, 5, 6, 2, 2, 8, 8, 8, 0, 5, 8, 9, 0,	8, 7, 9, 9, 1, 7, 3, 1, 3, 5,	8, 7, 9, 9, 1, 7, 3, 1, 3, 5,
n, 0, 7, 0, 2, 6, 2, 3, 8, 1, 6, 5}; nt k = 11111;	4, 4, 5, 4, 4, 8, 2, 1, 0, 5,	4, 4, 5, 4, 4, 8, 2, 1, 0, 5,
nt k = 11111; LNode* head = LLNode::createWithIterators(arr, arr	2, 3, 8, 2, 9, 2, 4, 3, 3, 7, 8, 1, 5, 5, 0, 4, 5, 2, 7, 7,	2, 3, 8, 2, 9, 2, 4, 3, 3, 7, 8, 1, 5, 5, 0, 4, 5, 2, 7, 7,
- sizeof(arr) / sizeof(int));	0, 8, 0, 4, 1, 9, 2, 0, 1, 6,	0, 8, 0, 4, 1, 9, 2, 0, 1, 6,
LLNode::printList(head);	3, 9, 8, 3, 8, 3, 7, 1, 2, 5,	3, 9, 8, 3, 8, 3, 7, 1, 2, 5,
out << "\n";	9, 1, 2, 9, 7, 4, 2, 4, 5, 5,	9, 1, 2, 9, 7, 4, 2, 4, 5, 5,
LNode* newhead = rotateLinkedList(head, k);	7, 9, 6, 9, 0, 6, 8, 0, 5, 3,	7, 9, 6, 9, 0, 6, 8, 0, 5, 3,
LNode::printList(newhead);	9, 1, 9, 9, 5, 6, 1, 0, 6, 2,	9, 1, 9, 9, 5, 6, 1, 0, 6, 2,
	0, 8, 1, 1, 2, 3, 5, 6, 8, 6,	0, 8, 1, 1, 2, 3, 5, 6, 8, 6,
	6, 4, 8, 7, 5, 4, 2, 7, 6, 8,	6, 4, 8, 7, 5, 4, 2, 7, 6, 8,
	0, 9, 2, 9, 5, 3, 3, 0, 6, 4,	0, 9, 2, 9, 5, 3, 3, 0, 6, 4,
	8, 8, 1, 6, 0, 5, 8, 6, 6, 1,	8, 8, 1, 6, 0, 5, 8, 6, 6, 1,
	1, 0, 3, 7, 4, 3, 0, 0, 3, 4,	1, 0, 3, 7, 4, 3, 0, 0, 3, 4,
TÀI LIÊ	0, 7, 0, 7, 1, 3, 7, 5, 7, 5, 8, 9, 3, 5, 8, 8, 8, 4, 5, 1,	0, 7, 0, 7, 1, 3, 7, 5, 7, 5, 8, 9, 3, 5, 8, 8, 8, 4, 5, 1,
IAILIÇ	2, 8, 6, 9, 6, 9, 2, 7, 6, 9,	2, 8, 6, 9, 6, 9, 2, 7, 6, 9,
	9, 4, 0, 8, 0, 4, 3, 5, 2, 0,	9, 4, 0, 8, 0, 4, 3, 5, 2, 0,
ROI H	3, 2, 6, 5, 8, 5, 2, 9, 8, 6,	3, 2, 6, 5, 8, 5, 2, 9, 8, 6,
	9, 8, 1, 7, 4, 9, 0, 2, 6, 8,	9, 8, 1, 7, 4, 9, 0, 2, 6, 8,
	1, 9, 9, 1, 3, 4, 5, 4, 1, 1,	1, 9, 9, 1, 3, 4, 5, 4, 1, 1,
	7, 5, 2, 0, 4, 3, 5, 3, 1, 4,	7, 5, 2, 0, 4, 3, 5, 3, 1, 4,
	0, 7, 7, 9, 1, 8, 6, 3, 9, 0,	0, 7, 7, 9, 1, 8, 6, 3, 9, 0,
	7, 7, 4, 7, 4, 3, 8, 2, 6, 4,	7, 7, 4, 7, 4, 3, 8, 2, 6, 4,
	0, 5, 8, 8, 7, 2, 7, 3, 2, 3,	0, 5, 8, 8, 7, 2, 7, 3, 2, 3,
	8, 7, 1, 3, 3, 7, 2, 2, 1, 6,	8, 7, 1, 3, 3, 7, 2, 2, 1, 6,
	3, 4, 6, 5, 3, 4, 0, 2, 1, 2,	3, 4, 6, 5, 3, 4, 0, 2, 1, 2,
	5, 1, 2, 6, 9, 6, 8, 0, 9, 7,	5, 1, 2, 6, 9, 6, 8, 0, 9, 7,
	7, 8, 8, 6, 9, 7, 8, 1, 5, 3, 3, 8, 8, 4, 7, 6, 2, 2, 7, 0,	7, 8, 8, 6, 9, 7, 8, 1, 5, 3,
	6, 8, 1, 5, 2, 5, 6, 2, 1, 2,	3, 8, 8, 4, 7, 6, 2, 2, 7, 0, 6, 8, 1, 5, 2, 5, 6, 2, 1, 2,
	4, 9, 2, 6, 0, 2, 8, 0, 9, 9,	4, 9, 2, 6, 0, 2, 8, 0, 9, 9,
	4, 7, 5, 4, 6, 6, 5, 2, 3, 9,	4, 7, 5, 4, 6, 6, 5, 2, 3, 9,
	2, 7, 0, 6, 7, 1, 5, 4, 9, 8,	2, 7, 0, 6, 7, 1, 5, 4, 9, 8,
	3, 2, 1, 4, 7, 9, 9, 6, 9, 6,	3, 2, 1, 4, 7, 9, 9, 6, 9, 6,
	6, 6, 0, 9, 8, 5, 7, 3, 4, 8,	6, 6, 0, 9, 8, 5, 7, 3, 4, 8,
	0, 4, 1, 1, 0, 9, 8, 4, 1, 7,	0, 4, 1, 1, 0, 9, 8, 4, 1, 7,
	3, 1, 1, 2, 5, 4, 4, 6, 2, 7,	3, 1, 1, 2, 5, 4, 4, 6, 2, 7,
	4, 5, 8, 5, 3, 0, 7, 1, 7, 3,	4, 5, 8, 5, 3, 0, 7, 1, 7, 3,
	8, 5, 1, 1, 7, 2, 2, 4, 3, 4,	8, 5, 1, 1, 7, 2, 2, 4, 3, 4,
	5, 4, 3, 0, 3, 7, 2, 0, 9, 3,	5, 4, 3, 0, 3, 7, 2, 0, 9, 3,
	4, 2, 4, 3, 5, 7, 8, 4, 7, 4,	4, 2, 4, 3, 5, 7, 8, 4, 7, 4,
	9, 5, 6, 4, 5, 0, 5, 2, 9, 6,	9, 5, 6, 4, 5, 0, 5, 2, 9, 6,
	9, 3, 5, 6, 9, 9, 0, 5, 2, 1,	9, 3, 5, 6, 9, 9, 0, 5, 2, 1,
B A C H	KHOACNCD COM	ı İ

	1	
Test	Expected	Got
	0, 4, 6, 1, 1, 7, 8, 8, 5, 3,	0, 4, 6, 1, 1, 7, 8, 8, 5, 3,
	5, 8, 1, 1, 2, 6, 8, 1, 8, 2,	5, 8, 1, 1, 2, 6, 8, 1, 8, 2,
	3, 9, 3, 0, 5, 8, 0, 0, 6, 2,	3, 9, 3, 0, 5, 8, 0, 0, 6, 2,
	4, 0, 2, 6, 2, 2, 8, 7, 1, 8, 6, 8, 2, 7, 9, 3, 6, 3, 5, 7,	4, 0, 2, 6, 2, 2, 8, 7, 1, 8, 6, 8, 2, 7, 9, 3, 6, 3, 5, 7,
	1, 7, 0, 8, 6, 6, 6, 5, 2, 6,	1, 7, 0, 8, 6, 6, 6, 5, 2, 6,
	3, 2, 6, 3, 5, 6, 5, 2, 3, 1,	3, 2, 6, 3, 5, 6, 5, 2, 3, 1,
	7, 0, 2, 3, 2, 3, 3, 0, 6, 1,	7, 0, 2, 3, 2, 3, 3, 0, 6, 1,
	5, 1, 1, 0, 2, 1, 7, 8, 8, 6,	5, 1, 1, 0, 2, 1, 7, 8, 8, 6,
	7, 2, 9, 6, 1, 0, 1, 2, 5, 0,	7, 2, 9, 6, 1, 0, 1, 2, 5, 0,
	0, 6, 5, 7, 7, 4, 6, 4, 7, 4, 1, 5, 6, 3, 1, 7, 5, 6, 4, 4,	0, 6, 5, 7, 7, 4, 6, 4, 7, 4, 1, 5, 6, 3, 1, 7, 5, 6, 4, 4,
	2, 8, 5, 7, 6, 2, 8, 1, 2, 2,	2, 8, 5, 7, 6, 2, 8, 1, 2, 2,
	0, 8, 9, 3, 5, 6, 4, 3, 4, 0,	0, 8, 9, 3, 5, 6, 4, 3, 4, 0,
	9, 7, 7, 0, 0, 9, 8, 8, 9, 6,	9, 7, 7, 0, 0, 9, 8, 8, 9, 6,
	4, 6, 6, 4, 8, 0, 8, 2, 8, 0,	4, 6, 6, 4, 8, 0, 8, 2, 8, 0,
	0, 4, 1, 3, 0, 2, 9, 7, 3, 3, 0, 5, 9, 0, 1, 4, 7, 1, 6, 4,	0, 4, 1, 3, 0, 2, 9, 7, 3, 3, 0, 5, 9, 0, 1, 4, 7, 1, 6, 4,
	4, 1, 4, 8, 9, 7, 5, 9, 1, 9,	4, 1, 4, 8, 9, 7, 5, 9, 1, 9,
	6, 5, 3, 4, 5, 3, 6, 1, 0, 4,	6, 5, 3, 4, 5, 3, 6, 1, 0, 4,
	3, 0, 9, 3, 8, 8, 9, 7, 3, 0,	3, 0, 9, 3, 8, 8, 9, 7, 3, 0,
	4, 2, 4, 9, 7, 4, 3, 2, 2, 8,	4, 2, 4, 9, 7, 4, 3, 2, 2, 8,
	9, 2, 5, 0, 9, 3, 2, 1, 9, 3, 2, 3, 2, 8, 0, 2, 5, 1, 6, 8,	9, 2, 5, 0, 9, 3, 2, 1, 9, 3, 2, 3, 2, 8, 0, 2, 5, 1, 6, 8,
. 40	3, 1, 7, 8, 2, 6, 2, 0, 2, 7,	3, 1, 7, 8, 2, 6, 2, 0, 2, 7,
, Kr.	2, 6, 7, 3, 6, 1, 5, 6, 3, 0,	2, 6, 7, 3, 6, 1, 5, 6, 3, 0,
C.Y.	4, 6, 4, 4, 2, 4, 1, 6, 0, 5,	4, 6, 4, 4, 2, 4, 1, 6, 0, 5,
OF CHIKH	5, 9, 3, 8, 4, 3, 4, 9, 6, 2,	5, 9, 3, 8, 4, 3, 4, 9, 6, 2,
	0, 4, 6, 0, 5, 0, 9, 0, 9, 7, 6, 8, 7, 0, 7, 3, 6, 1, 8, 4,	0, 4, 6, 0, 5, 0, 9, 0, 9, 7, 6, 8, 7, 0, 7, 3, 6, 1, 8, 4,
4	2, 8, 7, 0, 2, 5, 4, 0, 5, 7,	2, 8, 7, 0, 2, 5, 4, 0, 5, 7,
	4, 8, 5, 1, 2, 2, 1, 6, 5, 0,	4, 8, 5, 1, 2, 2, 1, 6, 5, 0,
	9, 4, 6, 2, 7, 7, 4, 2, 9, 7,	9, 4, 6, 2, 7, 7, 4, 2, 9, 7,
	6, 7, 5, 0, 5, 5, 2, 8, 8, 8,	6, 7, 5, 0, 5, 5, 2, 8, 8, 8,
	8, 2, 0, 6, 2, 1, 8, 9, 5, 1,	8, 2, 0, 6, 2, 1, 8, 9, 5, 1,
TÀIIIÊ	2, 8, 1, 5, 5, 7, 2, 8, 6, 1, 9, 6, 9, 4, 1, 0, 0, 9, 4, 1,	2, 8, 1, 5, 5, 7, 2, 8, 6, 1, 9, 6, 9, 4, 1, 0, 0, 9, 4, 1,
	1 1, 3, 3, 0, 1, 0, 4, 3, 2, 0,	1, 3, 9, 8, 1, 0, 4, 3, 2, 6,
вол н	5, 9, 8, 3, 7, 9, 4, 0, 6, 8,	5, 9, 8, 3, 7, 9, 4, 0, 6, 8,
	0, 4, 1, 5, 0, 5, 6, 5, 5, 1,	8, 4, 1, 5, 0, 5, 6, 3, 3, 1,
	0, 9, 3, 7, 6, 8, 7, 8, 1, 1, 0, 3, 1, 8, 9, 7, 9, 1, 8, 5,	0, 9, 3, 7, 6, 8, 7, 8, 1, 1, 0, 3, 1, 8, 9, 7, 9, 1, 8, 5,
	8, 3, 3, 0, 7, 2, 3, 8, 9, 5,	8, 3, 3, 0, 7, 2, 3, 8, 9, 5,
	0, 9, 4, 7, 7, 5, 6, 2, 2, 2,	0, 9, 4, 7, 7, 5, 6, 2, 2, 2,
	6, 5, 3, 1, 9, 5, 1, 4, 7, 7,	6, 5, 3, 1, 9, 5, 1, 4, 7, 7,
	4, 6, 6, 1, 6, 0, 6, 3, 8, 0,	4, 6, 6, 1, 6, 0, 6, 3, 8, 0,
	4, 2, 2, 0, 5, 3, 9, 8, 7, 6, 3, 5, 1, 9, 4, 5, 0, 7, 9, 1,	4, 2, 2, 0, 5, 3, 9, 8, 7, 6, 3, 5, 1, 9, 4, 5, 0, 7, 9, 1,
	9, 1, 3, 6, 3, 2, 3, 9, 2, 5,	9, 1, 3, 6, 3, 2, 3, 9, 2, 5,
	6, 0, 2, 7, 2, 7, 9, 1, 5, 1,	6, 0, 2, 7, 2, 7, 9, 1, 5, 1,
	4, 3, 9, 8, 6, 2, 1, 9, 0, 2,	4, 3, 9, 8, 6, 2, 1, 9, 0, 2,
	8, 1, 9, 3, 5, 2, 7, 7, 9, 9,	8, 1, 9, 3, 5, 2, 7, 7, 9, 9,
	9, 6, 6, 6, 7, 6, 1, 2, 7, 6, 4, 0, 9, 5, 6, 7, 5, 1, 3, 7,	9, 6, 6, 6, 7, 6, 1, 2, 7, 6, 4, 0, 9, 5, 6, 7, 5, 1, 3, 7,
	7, 8, 1, 6, 8, 4, 5, 4, 7, 2,	7, 8, 1, 6, 8, 4, 5, 4, 7, 2,
	4, 0, 1, 4, 8, 1, 2, 3, 0, 8,	4, 0, 1, 4, 8, 1, 2, 3, 0, 8,
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	4, 3, 1, 4, 5, 9, 8, 0, 8, 4, 9, 2, 4, 1, 9, 9, 1, 9, 5, 3,	4, 3, 1, 4, 5, 9, 8, 0, 8, 4, 9, 2, 4, 1, 9, 9, 1, 9, 5, 3,
0.4.011		-, -, -, +, -, -, -, -, -, -, -, -, -, -, -, -, -,
 BACH	KHOACNCP.COM	· ·

Test	Expected	Got
	3, 1, 9, 2, 6, 0, 3, 3, 3, 0,	3, 1, 9, 2, 6, 0, 3, 3, 3, 0,
	3, 9, 1, 2, 4, 5, 3, 5, 7, 9,	3, 9, 1, 2, 4, 5, 3, 5, 7, 9,
	7, 7, 4, 6, 9, 7, 5, 9, 9, 5,	7, 7, 4, 6, 9, 7, 5, 9, 9, 5,
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	6, 1, 8, 5, 8, 8, 3, 7, 1, 5,	6, 1, 8, 5, 8, 8, 3, 7, 1, 5,
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	6, 9, 6, 6, 4, 7]	6, 9, 6, 6, 4, 7]



Test	Expected	Got
int arr[] = {4, 3, 0, 1, 8, 3, 3, 8, 6, 8, 6, 6, 4,	[4, 3, 0, 1, 8, 3, 3, 8, 6, 8,	[4, 3, 0, 1, 8, 3, 3, 8, 6, 8,
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8, 6, 5, 4, 0, 9, 9, 6, 2, 8, 1, 7, 2, 6, 4, 9, 8,	2, 2, 9, 9, 1, 6, 2, 8, 1, 5,	2, 2, 9, 9, 1, 6, 2, 8, 1, 5,
1, 7, 6, 6, 2, 4, 5, 5, 0, 6, 8, 9, 3, 6, 2, 7, 3,	8, 6, 5, 4, 0, 9, 9, 6, 2, 8,	8, 6, 5, 4, 0, 9, 9, 6, 2, 8,
0, 2, 6, 8, 9, 9, 6, 8, 2, 5, 0, 8, 0, 9, 7, 5, 6,	1, 7, 2, 6, 4, 9, 8, 1, 7, 6,	1, 7, 2, 6, 4, 9, 8, 1, 7, 6,
4, 5, 3, 1, 5, 5, 1, 4, 4, 9, 1, 0, 2, 3, 5, 4, 9,	6, 2, 4, 5, 5, 0, 6, 8, 9, 3,	6, 2, 4, 5, 5, 0, 6, 8, 9, 3,
3, 2, 2, 3, 9, 7, 8, 6, 7, 7, 4, 4, 8, 0, 6, 6, 2,	6, 2, 7, 3, 0, 2, 6, 8, 9, 9,	6, 2, 7, 3, 0, 2, 6, 8, 9, 9,
5, 8, 7, 6, 8, 7, 1, 7, 6, 1, 9, 2, 0, 3, 7, 1, 0, 0, 4, 5, 4, 4, 2, 9, 4, 6, 4, 5, 0, 8, 3, 9, 8, 2,	6, 8, 2, 5, 0, 8, 0, 9, 7, 5, 6, 4, 5, 3, 1, 5, 5, 1, 4, 4,	6, 8, 2, 5, 0, 8, 0, 9, 7, 5, 6, 4, 5, 3, 1, 5, 5, 1, 4, 4,
4, 9, 2, 4, 2, 6, 5, 2, 3, 5, 3, 8, 7, 6, 1, 2, 7,	9, 1, 0, 2, 3, 5, 4, 9, 3, 2,	9, 1, 0, 2, 3, 5, 4, 9, 3, 2,
9, 8, 7, 4, 8, 5, 4, 3, 1, 6, 0, 6, 6, 9, 4, 0, 4,	2, 3, 9, 7, 8, 6, 7, 7, 4, 4,	2, 3, 9, 7, 8, 6, 7, 7, 4, 4,
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9, 6, 1, 9, 4, 4, 1, 0, 9, 1, 2, 4, 8, 3, 1, 1, 7,	7, 1, 7, 6, 1, 9, 2, 0, 3, 7,	7, 1, 7, 6, 1, 9, 2, 0, 3, 7,
1, 7, 5, 5, 7, 1, 1, 1, 0, 0, 6, 7, 2, 3, 6, 6, 1,	1, 0, 0, 4, 5, 4, 4, 2, 9, 4,	1, 0, 0, 4, 5, 4, 4, 2, 9, 4,
4, 6, 8, 9, 7, 0, 8, 7, 8, 8, 0, 9, 0, 0, 2, 0, 5,	6, 4, 5, 0, 8, 3, 9, 8, 2, 4,	6, 4, 5, 0, 8, 3, 9, 8, 2, 4,
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7, 0, 5, 9, 3, 0, 6, 6, 1, 0, 2, 1, 6, 2, 4, 9, 8,	8, 7, 6, 1, 2, 7, 9, 8, 7, 4,	8, 7, 6, 1, 2, 7, 9, 8, 7, 4,
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8, 1, 2, 0, 6, 9, 0, 7, 7, 8, 4, 3, 1, 9, 5, 2, 4,	4, 0, 4, 0, 0, 7, 8, 9, 4, 6,	4, 0, 4, 0, 0, 7, 8, 9, 4, 6,
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4, 8, 1, 8, 7, 1, 6, 0, 2, 5, 7, 8, 0, 2, 2, 5, 8, 0, 4, 3, 1, 8, 2, 2, 7, 9, 1, 0, 0, 9, 1, 7, 4, 6,	5, 7, 1, 1, 1, 0, 0, 6, 7, 2, 3, 6, 6, 1, 4, 6, 8, 9, 7, 0,	5, 7, 1, 1, 1, 0, 0, 6, 7, 2, 3, 6, 6, 1, 4, 6, 8, 9, 7, 0,
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9, 4, 1, 7, 0, 1, 2, 7, 5, 3, 7, 3, 9, 6, 4, 6, 8,	5, 4, 6, 2, 3, 2, 1, 7, 5, 5,	5, 4, 6, 2, 3, 2, 1, 7, 5, 5,
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6, 9, 5, 8, 5, 7, 2, 2, 2, 8, 7, 3, 2, 2, 0, 5, 5,	6, 5, 4, 7, 8, 4, 7, 5, 9, 6,	6, 5, 4, 7, 8, 4, 7, 5, 9, 6,
1, 9, 5, 5, 5, 7, 0, 0, 9, 2, 9, 7, 4, 3, 9, 5, 6,	9, 4, 4, 8, 4, 7, 2, 7, 2, 4,	9, 4, 4, 8, 4, 7, 2, 7, 2, 4,
9, 5, 2, 4, 3, 8, 3, 0, 2, 6, 8, 9, 9, 8, 5, 0, 3,	6, 1, 9, 1, 4, 5, 9, 3, 9, 5,	6, 1, 9, 1, 4, 5, 9, 3, 9, 5,
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0, 6, 5, 0, 9, 4, 2, 4, 3, 7, 7, 8, 7, 8, 8, 5, 4,	8, 7, 1, 6, 5, 5, 5, 2, 0, 3,	8, 7, 1, 6, 5, 5, 5, 2, 0, 3,
7, 7, 2, 2, 9, 0, 5, 9, 0, 7, 4, 9, 7, 5, 3, 2, 3,	4, 8, 1, 8, 7, 1, 6, 0, 2, 5,	4, 8, 1, 8, 7, 1, 6, 0, 2, 5,
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6, 9, 9, 0, 1, 2, 7, 6, 7, 2, 1, 4, 0, 2, 7, 4, 1, 5, 3, 8, 3, 2, 6, 9, 8, 8, 9, 7, 1, 6, 9, 9, 6, 9,	1, 8, 2, 2, 7, 9, 1, 0, 0, 9, 1, 7, 4, 6, 2, 5, 5, 9, 3, 2,	1, 8, 2, 2, 7, 9, 1, 0, 0, 9, 1, 7, 4, 6, 2, 5, 5, 9, 3, 2,
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2, 8, 3, 7, 1, 1, 2, 1, 9, 7, 5, 8, 9, 8, 8, 6, 5,	3, 7, 3, 9, 6, 4, 6, 8, 4, 0,	3, 7, 3, 9, 6, 4, 6, 8, 4, 0,
6, 2, 7, 7, 7, 5, 1, 8, 4, 6, 5, 7, 8, 7, 9, 7, 6,	2, 4, 7, 9, 0, 2, 0, 0, 0, 2,	2, 4, 7, 9, 0, 2, 0, 0, 0, 2,
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5, 4, 8, 8, 8, 5, 5, 5, 6, 9, 9, 7, 7, 7, 8, 6, 9,	7, 9, 9, 4, 6, 7, 0, 2, 3, 7,	7, 9, 9, 4, 6, 7, 0, 2, 3, 7,
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1, 0, 7, 1, 8, 6, 7, 9, 9, 5, 2, 7, 2, 0, 3, 4, 5,	1, 2, 9, 8, 7, 7, 4, 5, 7, 7,	1, 2, 9, 8, 7, 7, 4, 5, 7, 7,
0, 7, 9, 6, 2, 3, 3, 9, 5, 9, 4, 1, 9, 9, 7, 5, 1,	1, 4, 0, 5, 6, 9, 1, 1, 1, 4,	1, 4, 0, 5, 6, 9, 1, 1, 1, 4,
2, 7, 5, 4, 7, 1, 8, 1, 2, 7, 8, 4, 8, 8, 1, 8, 9,	0, 8, 5, 0, 0, 3, 7, 5, 1, 0,	0, 8, 5, 0, 0, 3, 7, 5, 1, 0,
1, 1, 2, 1, 0, 5, 2, 0, 4, 8, 5, 9, 7, 5, 0, 8, 5, 8, 9, 3, 8, 9, 1, 8, 9, 3, 9, 6, 3, 3, 7, 0, 1, 3,	8, 6, 3, 4, 0, 1, 1, 8, 3, 8, 6, 9, 5, 8, 5, 7, 2, 2, 2, 8,	8, 6, 3, 4, 0, 1, 1, 8, 3, 8, 6, 9, 5, 8, 5, 7, 2, 2, 2, 8,
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1, 5, 9, 3, 8, 1, 4, 8, 8, 8, 8, 5, 5, 5, 1, 2, 1,	3, 1, 8, 2, 5, 1, 4, 2, 5, 4,	3, 1, 8, 2, 5, 1, 4, 2, 5, 4,
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9, 8, 6, 8, 0, 2, 9, 3, 0, 8, 8, 6, 9, 4, 0, 8, 4,	5, 0, 9, 4, 2, 4, 3, 7, 7, 8,	5, 0, 9, 4, 2, 4, 3, 7, 7, 8,
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6, 2, 2, 0, 7, 5, 3, 4, 1, 9, 4, 0, 9, 2, 7, 8, 7,	2, 3, 6, 2, 8, 3, 9, 6, 8, 4,	2, 3, 6, 2, 8, 3, 9, 6, 8, 4,

Test	Expected	Got
1, 6, 2, 9, 8, 8, 1, 5, 3, 0, 4, 3, 0, 1, 6, 2, 5,	8, 6, 8, 7, 4, 3, 3, 7, 4, 6,	8, 6, 8, 7, 4, 3, 3, 7, 4, 6,
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4, 1, 4, 8, 9, 2, 2, 9, 1, 1, 7, 3, 9, 6, 2, 6, 3,	4, 0, 2, 7, 4, 1, 5, 3, 8, 3,	4, 0, 2, 7, 4, 1, 5, 3, 8, 3,
8, 9, 0, 2, 7, 9, 5, 6, 2, 0, 4, 0, 4, 2, 7, 1, 4,	2, 6, 9, 8, 8, 9, 7, 1, 6, 9,	2, 6, 9, 8, 8, 9, 7, 1, 6, 9,
3, 0, 7, 0, 2, 0, 9, 3, 9, 5, 2, 2, 8, 4, 2, 0, 0,	9, 6, 9, 4, 2, 1, 6, 2, 5, 4,	9, 6, 9, 4, 2, 1, 6, 2, 5, 4,
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7, 3, 0, 5, 1, 8, 5, 2, 9, 7, 4, 0, 9, 8, 5, 1, 0,	1, 8, 4, 6, 5, 7, 8, 7, 9, 7,	1, 8, 4, 6, 5, 7, 8, 7, 9, 7,
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8, 7, 2, 8, 0, 9, 3, 5, 2, 7, 9, 3, 5, 5, 3, 8, 7,	2, 4, 0, 3, 1, 8, 6, 3, 7, 0,	2, 4, 0, 3, 1, 8, 6, 3, 7, 0,
1, 4, 0, 3, 2, 8, 0, 4, 4, 8, 0, 7, 7, 2, 3, 1, 4,	9, 7, 4, 1, 4, 6, 4, 2, 1, 5,	9, 7, 4, 1, 4, 6, 4, 2, 1, 5,
8, 5, 5, 3, 2, 9, 3, 6, 9, 3, 1, 5, 5, 5, 1, 6, 0,	1, 3, 8, 3, 5, 4, 8, 2, 0, 1,	1, 3, 8, 3, 5, 4, 8, 2, 0, 1,
5, 5, 9, 8, 0, 6, 9, 8, 6, 7, 5, 5, 7, 1, 2, 8, 2,	0, 8, 4, 1, 2, 2, 7, 2, 2, 3,	0, 8, 4, 1, 2, 2, 7, 2, 2, 3,
7, 2, 4, 9, 7, 0, 9, 8, 7, 2, 2, 0, 5, 5, 8, 4, 9,	1, 8, 2, 8, 2, 4, 6, 5, 4, 1,	1, 8, 2, 8, 2, 4, 6, 5, 4, 1,
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7, 5, 4, 5, 4, 6, 5, 7, 8, 7, 8, 1, 6, 0, 4, 4, 8,	5, 5, 5, 1, 2, 1, 3, 7, 8, 2,	5, 5, 5, 1, 2, 1, 3, 7, 8, 2,
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9, 6, 0, 7, 0, 3, 6, 4, 5, 7, 9, 8, 6, 6, 6, 8, 7,	2, 1, 6, 4, 9, 2, 7, 4, 6, 0,	0, 5, 6, 4, 1, 3, 1, 9, 4, 3, 2, 1, 6, 4, 9, 2, 7, 4, 6, 0,
3, 9, 6, 3, 4, 8, 8, 3, 0, 3, 3, 7, 3, 7, 6, 0, 1,	1, 2, 6, 8, 0, 9, 8, 3, 0, 7,	1, 2, 6, 8, 0, 9, 8, 3, 0, 7,
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7, 4, 9, 1, 4, 4, 1, 8, 0, 7, 3, 2, 0, 1, 6, 6, 9,	7, 1, 6, 2, 9, 8, 8, 1, 5, 3,	7, 1, 6, 2, 9, 8, 8, 1, 5, 3,
1, 4, 5, 6, 1, 7, 0, 6, 8, 0, 2, 9, 0, 3, 3, 9, 3,	0, 4, 3, 0, 1, 6, 2, 5, 1, 9,	0, 4, 3, 0, 1, 6, 2, 5, 1, 9,
9, 5, 8, 6, 9, 1, 2, 6, 1, 8, 8, 9, 6, 4, 6, 8, 2,	8, 4, 4, 9, 9, 0, 5, 9, 0, 4,	8, 4, 4, 9, 9, 0, 5, 9, 0, 4,
9, 3, 0, 5, 4, 8, 6, 3, 0, 2, 7, 9, 9, 9, 4, 1, 7,	1, 3, 8, 2, 1, 4, 1, 4, 8, 9,	1, 3, 8, 2, 1, 4, 1, 4, 8, 9,
1, 0, 8, 0, 1, 4, 1, 6, 8, 5, 3, 4, 2, 6, 9, 3, 3,	2, 2, 9, 1, 1, 7, 3, 9, 6, 2,	2, 2, 9, 1, 1, 7, 3, 9, 6, 2,
7, 7, 1, 0, 2, 5, 9, 7, 5, 5, 8, 3, 2, 1, 0, 6, 5,	6, 3, 8, 9, 0, 2, 7, 9, 5, 6,	6, 3, 8, 9, 0, 2, 7, 9, 5, 6,
5, 9, 7, 4, 9, 8, 0, 4, 5, 8, 3, 4, 2, 8, 8, 0, 5,	2, 0, 4, 0, 4, 2, 7, 1, 4, 3,	2, 0, 4, 0, 4, 2, 7, 1, 4, 3,
1, 8, 8, 9, 0, 0, 9, 0, 2, 3, 2, 5, 8, 3, 7, 8, 0,	0, 7, 0, 2, 0, 9, 3, 9, 5, 2,	0, 7, 0, 2, 0, 9, 3, 9, 5, 2,
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2, 7, 1, 2, 8, 7, 5, 1, 7, 9, 3, 7, 0, 0, 3, 8, 0,	9, 1, 3, 8, 5, 8, 1, 1, 9, 8,	9, 1, 3, 8, 5, 8, 1, 1, 9, 8,
7, 9, 6, 8, 7, 4, 0, 3, 0, 5, 8, 6, 4, 2, 0, 0, 8,	1, 0, 4, 9, 4, 6, 5, 4, 8, 4,	1, 0, 4, 9, 4, 6, 5, 4, 8, 4,
0, 7, 8, 0, 2, 7, 8, 4, 0, 6, 5, 9, 2, 2, 8, 4, 5, 6. 0. 1. 5. 2. 6. 2. 3. 4. 2. 6. 7. 1. 1. 2. 7. 2.	4, 4, 3, 1, 6, 5, 7, 5, 3, 4, 2, 4, 9, 1, 1, 8, 4, 7, 4, 0,	4, 4, 3, 1, 6, 5, 7, 5, 3, 4, 2, 4, 9, 1, 1, 8, 4, 7, 4, 0,
6, 0, 1, 5, 2, 6, 2, 3, 4, 2, 6, 7, 1, 1, 2, 7, 2, 3, 9, 2, 2, 2, 1, 6, 5, 0, 0, 8, 2, 1, 8, 9, 8, 5,	2, 4, 9, 1, 1, 8, 4, 7, 4, 0, 6, 2, 2, 0, 0, 2, 8, 6, 7, 5,	6, 2, 2, 0, 0, 2, 8, 6, 7, 5,
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3, 9, 5, 3, 0, 0, 2, 7, 4, 9, 3, 9, 9, 6, 2, 8, 0,	5, 3, 8, 3, 0, 3, 0, 5, 2, 0,	5, 3, 8, 3, 0, 3, 0, 5, 2, 0,
4, 9, 6, 3, 0, 2, 5, 2, 2, 6, 3, 6, 0, 3, 4, 3, 9,	9, 7, 3, 0, 5, 1, 8, 5, 2, 9,	9, 7, 3, 0, 5, 1, 8, 5, 2, 9,
0, 6, 4, 3, 0, 3, 5, 8, 9, 5, 6, 5, 1, 7, 0, 1, 0,	7, 4, 0, 9, 8, 5, 1, 0, 8, 1,	7, 4, 0, 9, 8, 5, 1, 0, 8, 1,
9, 7, 9, 5, 0, 3, 4, 3, 4, 1, 1, 2, 0, 1, 0, 7, 7,	8, 1, 3, 9, 1, 8, 7, 2, 6, 0,	8, 1, 3, 9, 1, 8, 7, 2, 6, 0,
	, , , , , =, =, ., =, 0, 0,	, , , , , , , , , , , , , , , , , , ,

Test	Expected	Got
5, 0, 3, 3, 7, 1, 0, 7, 4, 2, 5, 4, 9, 4, 3, 4, 9,	9, 0, 5, 2, 3, 6, 0, 6, 0, 6,	9, 0, 5, 2, 3, 6, 0, 6, 0, 6,
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3, 5, 8, 3, 3, 1, 9, 0, 9, 1, 6, 1, 9, 2, 6, 4, 7,	4,snip 1, 9, 1, 5, 1,	4,snip 1, 9, 1, 5, 1,
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3, 9, 9, 8, 2, 2, 5, 6, 2, 4, 1, 7, 0, 1, 6, 1, 0,	2, 3, 5, 3, 5, 7, 1, 0, 1, 1,	2, 3, 5, 3, 5, 7, 1, 0, 1, 1,
9, 4, 7, 9, 9, 8, 8, 8, 9, 3, 5, 7, 7, 2, 5, 0, 3,	2, 6, 9, 5, 2, 0, 6, 3, 5, 4,	2, 6, 9, 5, 2, 0, 6, 3, 5, 4,
9, 9, 4, 2, 5, 0, 9, 9, 9, 5, 0, 7, 9, 2, 2, 6, 3,	3, 0, 6, 1, 4, 8, 7, 5, 3, 6,	3, 0, 6, 1, 4, 8, 7, 5, 3, 6,
4, 6, 1, 6, 9, 6, 6, 2, 0, 8, 0, 7, 0, 7, 8, 7, 0,	1, 0, 4, 8, 7, 5, 1, 4, 6, 1,	1, 0, 4, 8, 7, 5, 1, 4, 6, 1,
2, 8, 6, 0, 4, 8, 6, 7, 8, 0, 2, 5, 0, 2, 5, 4, 4,	0, 0, 2, 1, 9, 2, 3, 3, 5, 6,	0, 0, 2, 1, 9, 2, 3, 3, 5, 6,
8, 2, 7, 9, 8, 1, 2, 4, 5, 4, 5, 6, 7, 6, 2, 0, 2,	8, 0, 3, 1, 1, 0, 6, 8, 9, 4,	8, 0, 3, 1, 1, 0, 6, 8, 9, 4,
5, 9, 5, 0, 5, 4, 3, 6, 2, 5, 0, 4, 5, 9, 7, 4, 4,	8, 0, 5, 1, 0, 4, 0, 5, 6, 3,	8, 0, 5, 1, 0, 4, 0, 5, 6, 3,
5, 0, 3, 7, 5, 4, 5, 0, 0, 5, 2, 0, 8, 0, 3, 5, 2,	6, 6, 1, 3, 5, 0, 0, 7, 9, 1,	6, 6, 1, 3, 5, 0, 0, 7, 9, 1,
9, 8, 5, 6, 3, 0, 3, 5, 6, 2, 2, 8, 1, 4, 9, 8, 8,	7, 9, 1, 7, 3, 3, 4, 0, 2, 5,	7, 9, 1, 7, 3, 3, 4, 0, 2, 5,
7, 7, 1, 4, 8, 2, 1, 3, 9, 8, 8, 0, 5, 0, 5, 2, 4,	0, 8, 7, 3, 9, 4, 9, 7, 7, 9,	0, 8, 7, 3, 9, 4, 9, 7, 7, 9,
0, 4, 6, 0, 8, 5, 7, 2, 9, 6, 4, 2, 0, 0, 7, 7, 1,	0, 2, 1, 6, 8, 2, 0, 7, 9, 9,	0, 2, 1, 6, 8, 2, 0, 7, 9, 9,
2, 4, 4, 3, 6, 2, 0, 2, 9, 8, 0, 8, 0, 2, 2, 5, 3,	4, 2, 2, 8, 8, 1, 7, 9, 7, 8,	4, 2, 2, 8, 8, 1, 7, 9, 7, 8,
2, 2, 8, 5, 7, 5, 5, 7, 4, 2, 4, 2, 9, 4, 1, 4, 1,	7, 7, 6, 7, 2, 9, 4, 6, 2, 5,	7, 7, 6, 7, 2, 9, 4, 6, 2, 5,
8, 8, 4, 1, 0, 3, 4, 0, 5, 8, 8, 4, 4, 2, 7, 0, 3,	1, 7, 3, 3, 1, 7, 5, 4, 9, 9,	1, 7, 3, 3, 1, 7, 5, 4, 9, 9,
1, 3, 3, 1, 4, 4, 1, 7, 4, 9, 3, 2, 3, 7, 0, 8, 1,	4, 0, 4, 7, 4, 3, 5, 2, 9, 7,	4, 0, 4, 7, 4, 3, 5, 2, 9, 7,
9, 7, 2, 1, 9, 3, 7, 6, 0, 5, 1, 4};	5, 6, 9, 2, 0, 1, 9, 7, 2, 5,	5, 6, 9, 2, 0, 1, 9, 7, 2, 5,
int k = 5555;	0, 6, 2, 6, 4, 1, 5, 1, 7, 9,	0, 6, 2, 6, 4, 1, 5, 1, 7, 9,
LLNode* head = LLNode::createWithIterators(arr, arr	0, 5, 2, 4, 1, 3, 9, 7, 2, 4,	0, 5, 2, 4, 1, 3, 9, 7, 2, 4,
+ sizeof(arr) / sizeof(int));	0, 9, 2, 6, 6, 2, 9, 1, 1, 3,	0, 9, 2, 6, 6, 2, 9, 1, 1, 3,
LLNode::printList(head);	4, 4, 9, 0, 5, 1, 7, 7, 4, 5,	4, 4, 9, 0, 5, 1, 7, 7, 4, 5,
cout << "\n";	0, 5, 4, 7, 1, 9, 1, 0, 5, 6,	0, 5, 4, 7, 1, 9, 1, 0, 5, 6,
LLNode* newhead = rotateLinkedList(head, k);	3, 4, 2, 0, 1, 6, 6, 5, 4, 0,	3, 4, 2, 0, 1, 6, 6, 5, 4, 0,
LLNode::printList(newhead);	0, 7, 8, 3, 4, 3, 7, 1, 3, 1,	0, 7, 8, 3, 4, 3, 7, 1, 3, 1,
	9, 0, 4, 3, 5, 0, 9, 7, 9, 3,	9, 0, 4, 3, 5, 0, 9, 7, 9, 3,
	0, 2, 9, 3, 0, 8, 0, 0, 5, 2,	0, 2, 9, 3, 0, 8, 0, 0, 5, 2,
	8, 5, 8, 0, 6, 3, 8, 7, 3, 6,	8, 5, 8, 0, 6, 3, 8, 7, 3, 6,
	2, 3, 7, 8, 5, 5, 4, 9, 5, 5,	2, 3, 7, 8, 5, 5, 4, 9, 5, 5,
	3, 7, 7, 0, 0, 0, 0, 5, 4, 6,	3, 7, 7, 0, 0, 0, 0, 5, 4, 6,
_2	1, 2, 3, 2, 2, 9, 1, 1, 5, 9,	1, 2, 3, 2, 2, 9, 1, 1, 5, 9,
TAIIIF	8, 8, 9, 9, 4, 4, 1, 8, 2, 9,	8, 8, 9, 9, 4, 4, 1, 8, 2, 9,
1711 =1-	9, 0, 8, 0, 2, 2, 3, 9, 3, 3,	9, 0, 8, 0, 2, 2, 3, 9, 3, 3,
B Ở L H	0, 1, 4, 7, 6, 6, 0, 6, 4, 1,	0, 1, 4, 7, 6, 6, 0, 6, 4, 1,
5011	2, 8, 7, 9, 2, 7, 0, 7, 9, 8,	2, 8, 7, 9, 2, 7, 0, 7, 9, 8,
	0, 8, 7, 4, 4, 2, 3, 5, 0, 2,	0, 8, 7, 4, 4, 2, 3, 5, 0, 2,
	7, 9, 5, 8, 5, 9, 9, 1, 1, 7,	7, 9, 5, 8, 5, 9, 9, 1, 1, 7,
	7, 6, 3, 6, 3, 1, 3, 9, 8, 5,	7, 6, 3, 6, 3, 1, 3, 9, 8, 5,
	6, 1, 3, 6, 1, 1, 7, 0, 4, 5,	6, 1, 3, 6, 1, 1, 7, 0, 4, 5,
	7, 6, 2, 8, 8, 2, 7, 7, 1, 4,	7, 6, 2, 8, 8, 2, 7, 7, 1, 4,
	4, 3, 7, 9, 0, 1, 6, 0, 3, 1,	4, 3, 7, 9, 0, 1, 6, 0, 3, 1,
	2, 6, 8, 2, 2, 1, 1, 0, 6, 9,	2, 6, 8, 2, 2, 1, 1, 0, 6, 9,
	1, 4, 7, 4, 3, 4, 6, 1, 6, 5,	1, 4, 7, 4, 3, 4, 6, 1, 6, 5,
	8, 4, 1, 2, 8, 5, 7, 6, 7, 8,	8, 4, 1, 2, 8, 5, 7, 6, 7, 8,
	5, 5, 7, 5, 4, 1, 4, 1, 8, 5,	5, 5, 7, 5, 4, 1, 4, 1, 8, 5,
	8, 0, 2, 1, 1, 7, 2, 3, 4, 6,	8, 0, 2, 1, 1, 7, 2, 3, 4, 6,
	3, 3, 5, 5, 5, 4, 1, 2, 3, 1,	3, 3, 5, 5, 5, 4, 1, 2, 3, 1,
	6, 5, 5, 9, 6, 9, 0, 1, 5, 6,	6, 5, 5, 9, 6, 9, 0, 1, 5, 6,
	8, 8, 5, 5, 9, 0, 1, 8, 4, 5,	8, 8, 5, 5, 9, 0, 1, 8, 4, 5,
	8, 6, 4, 5, 1, 4, 0, 1, 0, 2,	8, 6, 4, 5, 1, 4, 0, 1, 0, 2,
	2, 6, 7, 9, 0, 7, 0, 5, 0, 4,	2, 6, 7, 9, 0, 7, 0, 5, 0, 4,
	0, 1, 4, 0, 1, 0, 9, 9, 9, 1,	0, 1, 4, 0, 1, 0, 9, 9, 9, 1,
	0, 2, 1, 0, 2, 0, 2, 2, 2, 2,	9, 7, 1, 5, 9, 2, 9, 9, 7, 0,
	9, 7, 1, 5, 9, 2, 9, 9, 7, 0,	2, 1, 2, 2, 2, 2, 2, 1, 0,
		6, 0, 5, 5, 9, 7, 6, 4, 0, 4,
	9, 7, 1, 5, 9, 2, 9, 9, 7, 0,	
	9, 7, 1, 5, 9, 2, 9, 9, 7, 0, 6, 0, 5, 5, 9, 7, 6, 4, 0, 4,	6, 0, 5, 5, 9, 7, 6, 4, 0, 4,
	9, 7, 1, 5, 9, 2, 9, 9, 7, 0, 6, 0, 5, 5, 9, 7, 6, 4, 0, 4, 4, 4, 1, 5, 6, 9, 3, 1, 8, 3,	6, 0, 5, 5, 9, 7, 6, 4, 0, 4, 4, 4, 1, 5, 6, 9, 3, 1, 8, 3,
	9, 7, 1, 5, 9, 2, 9, 9, 7, 0, 6, 0, 5, 5, 9, 7, 6, 4, 0, 4, 4, 4, 1, 5, 6, 9, 3, 1, 8, 3, 0, 0, 4, 5, 6, 3, 6, 9, 2, 1,	6, 0, 5, 5, 9, 7, 6, 4, 0, 4, 4, 4, 1, 5, 6, 9, 3, 1, 8, 3, 0, 0, 4, 5, 6, 3, 6, 9, 2, 1,
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Test	Expected	Got
	7, 0, 7, 7, 9, 4, 8, 7, 5, 7,	7, 0, 7, 7, 9, 4, 8, 7, 5, 7,
	2, 6, 1, 6, 6, 2, 2, 2, 6, 4,	2, 6, 1, 6, 6, 2, 2, 2, 6, 4,
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	7, 8, 6, 1, 1, 8, 1, 2, 8, 9,	7, 8, 6, 1, 1, 8, 1, 2, 8, 9,
	4, 8, 3, 0, 6, 9, 1, 6, 7, 7,	4, 8, 3, 0, 6, 9, 1, 6, 7, 7,
	1, 6, 6, 6, 7, 4, 3, 2, 9, 2,	1, 6, 6, 6, 7, 4, 3, 2, 9, 2,
	5, 5, 8, 9, 4, 7, 5, 0, 1, 9, 2, 0, 0, 8, 9, 0, 8, 7, 8, 3,	5, 5, 8, 9, 4, 7, 5, 0, 1, 9, 2, 0, 0, 8, 9, 0, 8, 7, 8, 3,
	6, 6, 2, 6, 5, 2, 0, 5, 6, 1,	6, 6, 2, 6, 5, 2, 0, 5, 6, 1,
	9, 2, 1, 7, 2, 7, 1, 6, 5, 4,	9, 2, 1, 7, 2, 7, 1, 6, 5, 4,
	3, 1, 0, 3, 4, 1, 1, 3, 4, 9,	3, 1, 0, 3, 4, 1, 1, 3, 4, 9,
	8, 1, 6, 9, 4, 7, 1, 8, 4, 4,	8, 1, 6, 9, 4, 7, 1, 8, 4, 4,
	9, 4, 3, 4, 0, 6, 0, 5, 9, 4,	9, 4, 3, 4, 0, 6, 0, 5, 9, 4,
	4, 2, 8, 4, 3, 5, 8, 7, 4, 1,	4, 2, 8, 4, 3, 5, 8, 7, 4, 1,
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	4, 6, 1, 1, 2, 3, 4, 5, 6, 5,	4, 6, 1, 1, 2, 3, 4, 5, 6, 5,
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	5, 4, 3, 7, 7, 0, 2, 8, 2, 5,	5, 4, 3, 7, 7, 0, 2, 8, 2, 5,
	0, 4, 1, 6, 0, 9, 5, 5, 6, 3,	0, 4, 1, 6, 0, 9, 5, 5, 6, 3,
	8, 4, 9, 8, 8, 0, 9, 6, 3, 8,	8, 4, 9, 8, 8, 0, 9, 6, 3, 8,
	8, 2, 4, 1, 5, 2, 1, 2, 3, 4,	8, 2, 4, 1, 5, 2, 1, 2, 3, 4,
	1, 2, 9, 4, 8, 6, 6, 9, 9, 0,	1, 2, 9, 4, 8, 6, 6, 9, 9, 0,
	8, 5, 8, 5, 0, 2, 4, 8, 8, 6,	8, 5, 8, 5, 0, 2, 4, 8, 8, 6,
	4, 9, 5, 5, 8, 9, 1, 5, 7, 8, 5, 5, 4, 0, 3, 3, 2, 2, 3, 5, 1, 1, 6, 4, 4, 9, 3, 7, 3, 6, 0, 9, 3, 3, 4, 4, 7, 9, 9, 8, 0, 1, 2, 4, 6, 6, 1, 9, 7, 5, 3, 1, 6, 3, 6, 3, 3, 8, 1, 3, 4, 7, 9, 7, 3, 4, 3, 7, 1, 4, 9, 9, 2, 6, 2, 2, 2, 2, 2, 5, 6	4, 9, 5, 5, 8, 9, 1, 5, 7, 8,
	5, 5, 4, 0, 3, 3, 2, 2, 3, 5,	5, 5, 4, 0, 3, 3, 2, 2, 3, 5,
	1, 1, 6, 4, 4, 9, 3, 7, 3, 6,	1, 1, 6, 4, 4, 9, 3, 7, 3, 6,
(0, 9, 3, 3, 4, 4, 7, 9, 9, 8,	0, 9, 3, 3, 4, 4, 7, 9, 9, 8,
	0, 1, 2, 4, 6, 6, 1, 9, 7, 5,	0, 1, 2, 4, 6, 6, 1, 9, 7, 5,
X	3, 1, 6, 3, 6, 3, 3, 8, 1, 3,	3, 1, 6, 3, 6, 3, 3, 8, 1, 3,
Q	4, 7, 9, 7, 3, 4, 3, 7, 1, 4,	4, 7, 9, 7, 3, 4, 3, 7, 1, 4,
	3, 6, 3, 0, 2, 2, 6, 3, 3, 0,	9, 8, 3, 6, 2, 2, 8, 9, 5, 6,
	6, 6, 2, 2, 9, 5, 8, 3, 2, 0,	6, 6, 2, 2, 9, 5, 8, 3, 2, 0,
	9, 1, 9, 4, 4, 1, 7, 6, 4, 0, 1, 4, 3, 8, 7, 1, 4, 1, 4, 1,	9, 1, 9, 4, 4, 1, 7, 6, 4, 0,
	0, 1, 0, 4, 6, 0, 8, 6, 0, 5,	1, 4, 3, 8, 7, 1, 4, 1, 4, 1, 0, 1, 0, 4, 6, 0, 8, 6, 0, 5,
_	8 8 9 9 7 6 7 5 8 3	8, 8, 9, 9, 7, 6, 7, 5, 8, 3,
ΤÀ	2, 3, 2, 7, 3, 8, 3, 6, 2, 3, 3 1 4 3 4 1 5 5 8 0	2, 3, 2, 7, 3, 8, 3, 6, 2, 3,
IA		3, 1, 4, 3, 4, 1, 5, 5, 8, 0,
	BỞI H 2, 1, 15, 7, 0, 7, 1, 9, 2, 6,	2, 1, 5, 7, 0, 7, 1, 9, 2, 6,
	6, 7, 6, 9, 0, 6, 3, 0, 0, 8,	6, 7, 6, 9, 0, 6, 3, 0, 0, 8,
	1, 2, 5, 4, 2, 6, 5, 3, 8, 5,	1, 2, 5, 4, 2, 6, 5, 3, 8, 5,
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	5, 1, 3, 6, 9, 6, 8, 9, 0, 2,	5, 1, 3, 6, 9, 6, 8, 9, 0, 2,
	5, 5, 8, 3, 2, 4, 9, 2, 4, 6,	5, 5, 8, 3, 2, 4, 9, 2, 4, 6,
	8, 1, 9, 4, 9, 5, 5, 7, 4, 3,	8, 1, 9, 4, 9, 5, 5, 7, 4, 3,
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	7, 4, 6, 5, 6, 3, 7, 1, 4, 0,	7, 4, 6, 5, 6, 3, 7, 1, 4, 0,
	9, 3, 2, 7, 3, 1, 2, 3, 7, 9,	9, 3, 2, 7, 3, 1, 2, 3, 7, 9,
	5, 4, 1, 6, 6, 5, 6, 7, 7, 2,	5, 4, 1, 6, 6, 5, 6, 7, 7, 2,
	4, 6, 9, 8, 1, 6, 3, 8, 5, 2,	4, 6, 9, 8, 1, 6, 3, 8, 5, 2,
	9, 8, 5, 8, 5, 7, 1, 5, 0, 0,	9, 8, 5, 8, 5, 7, 1, 5, 0, 0,
	8, 2, 1, 9, 7, 2, 9, 3, 7, 6,	8, 2, 1, 9, 7, 2, 9, 3, 7, 6,
	2, 5, 2, 7, 3, 4, 3, 7, 5, 3,	2, 5, 2, 7, 3, 4, 3, 7, 5, 3,
	9, 9, 9, 3, 7, 6, 5, 6, 9, 9,	9, 9, 9, 3, 7, 6, 5, 6, 9, 9,
	2, 0, 8, 1, 9, 1, 8, 8, 8, 6,	2, 0, 8, 1, 9, 1, 8, 8, 8, 6,
	9, 2, 3, 3, 5, 2, 8, 0, 0, 3,	9, 2, 3, 3, 5, 2, 8, 0, 0, 3,
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	5, 8, 6, 7, 0, 9, 9, 6, 3, 8,	5, 8, 6, 7, 0, 9, 9, 6, 3, 8,
	1, 4, 8, 7, 2, 1, 1, 2, 0, 3,	1, 4, 8, 7, 2, 1, 1, 2, 0, 3,
	±, ¬, ∪, /, ∠, ±, ±, ∠, U, ⊃,	, _, _, ,, _, _, _, _, _, _, _, _,
		6, 7, 3, 5, 9, 2, 2, 2, 2, 7
	6, 7, 3, 5, 9, 2, 2, 2, 2, 7, 8, 2, 5, 8, 8, 7, 0, 0, 3, 4,	6, 7, 3, 5, 9, 2, 2, 2, 2, 7, 8, 2, 5, 8, 8, 7, 0, 0, 3, 4,

Test	Expected	Got
		1, 5, 9, 6, 3, 7, 6, 6, 8, 1,
		8, 0, 3, 1, 2, 9, 6, 0, 2, 2,
		2, 4, 0, 0, 5, 1, 1, 3, 3, 8,
		3, 4, 7, 6, 0, 3, 3, 4, 8, 4,
		0, 8, 1, 1, 3, 4, 8, 4, 3, 1,
		5, 2, 2, 4, 0, 2, 9, 5, 7, 7,
	2, 1, 0, 6, 9, 6]	2, 1, 0, 6, 9, 6]

Passed all tests! ✓



Điểm cho bài nộp này: 1,00/1,00.



Câu hỏi 7

Chính xác

Điểm 1,00 của 1,00

Class LLNode representing a node of singly linked lists is declared as below:

```
class LLNode {
public:
    int val;
    LLNode* next;
    LLNode(); // Constructor: val = 0, next = nullptr
    LLNode(int val, LLNode* next); // Constructor with customized data
}
```

Given a singly linked list head node.

Your task is to implement a function with following prototype:

```
LLNode* reverseLinkedList(LLNode* head);
```

The function returns head node of the reversed singly linked list.

Note:

- The iostream library has been included and namespace std is being used. No other libraries are allowed.
- The constructors and methods of class LLNode have been defined fully so you do not need to redefine them.
- You can write helper functions.

For example:

Test	B	CH		Result
<pre>int arr[] = {13, 88, 60, 7, 192}; LLNode* head = LLNode::createWithIterate</pre>	ors(arr, arr + :	sizeof(arr) /	<pre>sizeof(int));</pre>	[13, 88, 60, 7, 192] [192, 7, 60, 88, 13]
<pre>LLNode::printList(head); cout << "\n";</pre>				
<pre>LLNode* newhead = reverseLinkedList(head LLNode::printList(newhead); newhead->clear();</pre>	_ \ \	IỆU S	UU T	ÂΡ

BỞI HCMUT-CNCP

Answer: (penalty regime: 0 %)

Reset answer

```
1 LLNode* reverseLinkedList(LLNode* head) {
 2
        if(head == nullptr) return nullptr;
 3
        LLNode* tmp = head;
 4
        LLNode* newHead = new LLNode(head->val,nullptr);
 5
        tmp = tmp->next;
 6
        while(tmp!=nullptr){
            LLNode* newNode = new LLNode(tmp->val,newHead);
 7
 8
            newHead = newNode;
 9
            tmp = tmp->next;
10
11
        return newHead;
12
```

	Test	Expected	Got	
*	<pre>int arr[] = {13, 88, 60, 7, 192}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = reverseLinkedList(head); LLNode::printList(newhead); newhead->clear();</pre>	[13, 88, 60, 7, 192] [192, 7, 60, 88, 13]	[13, 88, 60, 7, 192] [192, 7, 60, 88, 13]	~
~	<pre>int arr[] = {}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = reverseLinkedList(head); LLNode::printList(newhead); newhead->clear();</pre>	[]		~
~	<pre>int arr[] = {31, 22, 46, 152, 14, 87, 196, 97, 5, 93}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = reverseLinkedList(head); LLNode::printList(newhead); newhead->clear();</pre>	[31, 22, 46, 152, 14, 87, 196, 97, 5, 93] [93, 5, 97, 196, 87, 14, 152, 46, 22, 31]	[31, 22, 46, 152, 14, 87, 196, 97, 5, 93] [93, 5, 97, 196, 87, 14, 152, 46, 22, 31]	*
~	<pre>int arr[] = {115, 59, 178, 39, 109, 18, 154, 106, 94, 174, 51, 33, 132, 195, 161, 37, 61, 107, 120, 190}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = reverseLinkedList(head); LLNode::printList(newhead); newhead->clear();</pre>	[115, 59, 178, 39, 109, 18, 154, 106, 94, 174, 51, 33, 132, 195, 161, 37, 61, 107, 120, 190] [190, 120, 107, 61, 37, 161, 195, 132, 33, 51, 174, 94, 106, 154, 18, 109, 39, 178, 59, 115]	[115, 59, 178, 39, 109, 18, 154, 106, 94, 174, 51, 33, 132, 195, 161, 37, 61, 107, 120, 190] [190, 120, 107, 61, 37, 161, 195, 132, 33, 51, 174, 94, 106, 154, 18, 109, 39, 178, 59, 115]	~

	Test	Expected	Got	
~	int arr[] = {104, 50, 154, 40, 15, 171, 56, 114, 67,	[104, 50, 154, 40, 15, 171,	[104, 50, 154, 40, 15, 171,	~
	90, 46, 179, 152, 177, 139, 45, 18, 55, 38, 158, 8,	56, 114, 67, 90, 46, 179, 152,	56, 114, 67, 90, 46, 179, 152,	
	157, 143, 37, 16, 83, 173, 82, 156, 51, 124, 25, 68,	177, 139, 45, 18, 55, 38, 158,	177, 139, 45, 18, 55, 38, 158,	
	51, 194, 105, 44, 17, 97, 0, 150, 66, 71, 81, 11,	8, 157, 143, 37, 16, 83, 173,	8, 157, 143, 37, 16, 83, 173,	
	180, 148, 160, 127, 93, 108, 13, 122, 172, 39, 88,	82, 156, 51, 124, 25, 68, 51,	82, 156, 51, 124, 25, 68, 51,	
	62, 38, 61, 156, 45, 131, 69, 191, 123, 42, 103, 56,	194, 105, 44, 17, 97, 0, 150,	194, 105, 44, 17, 97, 0, 150,	
	69, 138, 185, 162, 192, 147, 71, 80, 12, 36, 191,	66, 71, 81, 11, 180, 148, 160,	66, 71, 81, 11, 180, 148, 160,	
	121, 194, 86, 92, 183, 164, 97, 185, 130, 29, 174,	127, 93, 108, 13, 122, 172,	127, 93, 108, 13, 122, 172,	
	112, 194, 185, 132, 27, 197, 158, 151, 51, 174};	39, 88, 62, 38, 61, 156, 45,	39, 88, 62, 38, 61, 156, 45,	
	LLNode* head = LLNode::createWithIterators(arr, arr	131, 69, 191, 123, 42, 103,	131, 69, 191, 123, 42, 103,	
	+ sizeof(arr) / sizeof(int));	56, 69, 138, 185, 162, 192,	56, 69, 138, 185, 162, 192,	
	LLNode::printList(head);	147, 71, 80, 12, 36, 191, 121,	147, 71, 80, 12, 36, 191, 121,	
	cout << "\n";	194, 86, 92, 183, 164, 97,	194, 86, 92, 183, 164, 97,	
	<pre>LLNode* newhead = reverseLinkedList(head);</pre>	185, 130, 29, 174, 112, 194,	185, 130, 29, 174, 112, 194,	
	LLNode::printList(newhead);	185, 132, 27, 197, 158, 151,	185, 132, 27, 197, 158, 151,	
	newhead->clear();	51, 174]	51, 174]	
		[174, 51, 151, 158, 197, 27,	[174, 51, 151, 158, 197, 27,	
		132, 185, 194, 112, 174, 29,	132, 185, 194, 112, 174, 29,	
		130, 185, 97, 164, 183, 92,	130, 185, 97, 164, 183, 92,	
		86, 194, 121, 191, 36, 12, 80,	86, 194, 121, 191, 36, 12, 80,	
		71, 147, 192, 162, 185, 138,	71, 147, 192, 162, 185, 138,	
		69, 56, 103, 42, 123, 191, 69,	69, 56, 103, 42, 123, 191, 69,	
		131, 45, 156, 61, 38, 62, 88,	131, 45, 156, 61, 38, 62, 88,	
		39, 172, 122, 13, 108, 93,	39, 172, 122, 13, 108, 93,	
	1 HV	127, 160, 148, 180, 11, 81,	127, 160, 148, 180, 11, 81,	
	YK.	71, 66, 150, 0, 97, 17, 44,	71, 66, 150, 0, 97, 17, 44,	
	C.XX	105, 194, 51, 68, 25, 124, 51,	105, 194, 51, 68, 25, 124, 51,	
	2 /	156, 82, 173, 83, 16, 37, 143,	156, 82, 173, 83, 16, 37, 143,	
	Y /	157, 8, 158, 38, 55, 18, 45,	157, 8, 158, 38, 55, 18, 45,	
	Q C	139, 177, 152, 179, 46, 90,	139, 177, 152, 179, 46, 90,	
		67, 114, 56, 171, 15, 40, 154,	67, 114, 56, 171, 15, 40, 154,	
		50, 104]	50, 104]	

TÀI LIỆU SƯU TẬP

BỞI HCMUT-CNCP

	Test
>	int arr[] = {106, 14, 71, 71, 166, 172, 128, 128, 52, 113, 58, 184, 70, 73, 37, 83, 71, 46, 133, 100, 37, 186, 199, 69, 79, 71, 70, 13, 155, 90, 60, 82, 180, 125, 108, 160, 74, 93, 72, 152, 106, 11, 174, 164, 168, 6, 9, 41, 58, 65, 141, 22, 103, 49, 114, 197, 175, 131, 109, 135, 124, 19, 76, 109, 130, 15, 120, 12, 11, 77, 88, 56, 127, 162, 67, 133, 162, 22, 94, 122, 53, 132, 167, 111, 138, 61, 169, 64, 98, 159, 58, 147, 137, 50, 193, 190, 173, 28, 35, 108, 138, 110, 184, 82, 114, 199, 137, 156, 155, 167, 165, 134, 193, 22, 173, 176, 46, 61, 196, 137, 151, 69, 67, 87, 161, 72, 60, 70, 67, 109, 149, 16, 38, 127, 15, 12, 107, 48, 184, 185, 43, 178, 14, 188, 61, 79, 189, 144, 27, 41, 114, 182, 118, 76, 89, 126, 124, 195, 180, 133, 118, 96, 61, 95, 127, 40, 62, 102, 130, 174, 47, 131, 187, 103, 88, 109, 153, 80, 106, 199, 163, 106, 39, 85, 56, 174, 189, 114, 172, 43, 170, 46, 166, 169, 193, 13, 17, 190, 153, 80, 106, 199, 163, 106, 39, 85, 56, 174, 189, 61, 72, 154, 149, 59, 110, 139, 189, 99, 40, 84, 180, 23, 13, 9, 192, 163, 88, 1, 3, 149, 132, 36, 34, 120, 40, 48, 32, 91, 166, 42, 155, 30, 111, 140, 6, 189, 169, 50, 15, 144, 67, 145, 169, 49, 135, 49, 76, 0, 105, 90, 60, 75, 88, 150, 88, 122, 11, 158, 12, 43, 182, 152, 112, 65, 149, 14, 194, 146, 120, 114, 178, 177, 159, 105, 45, 160, 125, 159, 60, 99, 39, 73, 101, 162, 173, 127, 122, 157, 116, 139, 57, 101, 121, 45, 133, 151, 171, 186, 186, 116, 4, 173, 118, 103, 70, 133, 158, 119, 47, 142, 111, 110, 96, 68, 118, 153, 178, 174, 130, 176, 186, 23, 193, 40, 175, 107, 184, 168, 185, 56, 167, 169, 68, 42, 75, 26, 174, 92, 46, 18, 85, 131, 164, 15, 116, 197, 88, 183, 194, 153, 38, 87, 35, 179, 5, 32, 143, 104, 86, 184, 153, 194, 34, 17, 90, 154, 71, 66, 156, 167, 169, 68, 42, 75, 163, 160, 39, 22, 172, 28, 40, 72, 116, 139, 57, 101, 133, 194, 153, 38, 87, 35, 179, 5, 32, 143, 104, 86, 184, 167, 79, 29, 79, 7166, 186, 164, 55, 19, 133, 194, 153, 38, 88, 87, 35, 179, 5, 32, 143, 104, 86, 184, 167, 79, 29, 171, 199, 194, 154, 173, 182, 103, 30, 174, 85, 191, 116, 30, 16

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100, 37, 186, 199, 69, 79, 71,
70, 13, 155, 90, 60, 82, 180,
125, 108, 160, 74, 93, 72,
152, 106, 11, 174, 164, 168,
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103, 49, 114, 197, 175, 131,
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130, 15, 120, 12, 11, 77, 88,
56, 127, 162, 67, 133, 162,
22, 94, 122, 53, 132, 167,
111, 138, 61, 169, 64, 98,
159, 58, 147, 137, 50, 193,
190, 173, 28, 35, 108, 138,
110, 184, 82, 114, 199, 137,
156, 155, 167, 165, 134, 193,
22, 173, 176, 46, 61, 196,
137, 151, 69, 67, 87, 161, 72,
60, 70, 67, 109, 149, 16, 38,
127, 15, 12, 107, 48, 184,
185, 43, 178, 14, 188, 61, 79,
189, 144, 27, 41, 114, 182,
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180, 133, 118, 96, 61, 95,
127, 40, 62, 102, 130, 174,
47, 131, 187, 103, 88, 109,
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93, 112, 24, 156, 180, 150,
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109, 193, 13, 17, 190, 153,
80, 106, 199, 163, 106, 39,
85, 56, 174, 189, 61, 72, 154,
149, 59, 110, 139, 189, 99,
40, 84, 180, 23, 13, 9, 192,
163, 88, 1, 3, 149, 132, 36,
34, 120, 40, 48, 32, 91, 166,
42, 155, 30, 111, 140, 6, 189,
169, 50, 15, 144, 67, 145.
169, 49, 135, 49, 76, 0, 105,
90, 60, 75, 88, 150, 88, 122,
11, 158, 12, 43, 182, 152,
112, 65, 149, 14, 194, 146,
120, 114, 178, 177, 159, 105,
45, 169, 152, 150, 60, 99, 39,
73, 101, 162, 173, 127, 122,
157, 116, 139, 57, 101, 121,
45, 133, 151, 171, 186, 186,
116, 4, 173, 118, 103, 70,
133, 158, 119, 47, 142, 111,
110, 96, 68, 118, 153, 178,
174, 130, 176, 186, 23, 193,
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56, 167, 169, 68, 42, 75, 26,
174, 92, 46, 18, 85, 131, 164,
15, 116, 197, 88, 143, 8, 115,
199, 173, 142, 139, 162, 62,
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34, 17, 90, 154, 71, 6, 156,
76, 66, 172, 157, 39, 92, 68,
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63, 142, 190, 149, 58, 31, 19,
114, 35, 110, 108, 103, 27,
139, 97, 166, 186, 164, 55,
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Test	Expected	Got
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	121, 147, 65, 14, 96, 96, 189,	121, 147, 65, 14, 96, 96, 189,
	156, 121, 103, 183, 98, 126,	156, 121, 103, 183, 98, 126,
	94, 30, 85, 73, 104, 101, 102,	94, 30, 85, 73, 104, 101, 102,
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	161, 78, 60, 18, 185, 39, 84,	161, 78, 60, 18, 185, 39, 84,
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	116, 87, 125, 85, 99, 79, 40,	116, 87, 125, 85, 99, 79, 40,
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Expected

21, 138, 19, 195, 95, 123, 45, 111, 106, 198, 17, 194, 55, 142, 63, 189, 55, 102, 198, 99, 104, 150, 48, 108, 16, 196, 175, 195, 119, 12, 96, 98, 120, 27, 71, 147, 88, 1, 35, 154, 67, 37, 187, 90, 163, 21, 105, 165, 2, 14, 86, 1, 114, 81, 102, 79, 98, 7, 141, 117, 44, 190, 123, 182, 157, 132, 20, 64, 5, 11, 187, 167, 112, 118, 88, 136, 164, 19, 151, 0, 187, 65, 179, 6, 43, 148, 154, 111, 197, 119, 131, 73, 123, 1, 54, 185, 93, 156, 83, 129, 62, 161, 133, 84, 58, 144, 128, 196, 58, 95, 89, 158, 76, 88, 5, 188, 5, 80, 173, 156, 48, 85, 184, 166, 100, 176, 33, 140, 96, 27, 66, 69, 194, 37, 146, 107, 161, 11, 11, 150, 135, 145, 183, 135, 3, 106, 124, 34, 158, 149, 37, 134, 61, 112, 100, 54, 70, 81, 181, 141, 134, 130, 44, 30, 26, 29, 145, 2, 45, 9, 138, 158, 97, 43, 10, 195, 106, 32, 121, 111, 55, 98, 141, 93, 74, 33, 111, 105, 18, 124, 128, 86, 79, 41, 14, 75, 198, 33, 162, 171, 101, 111, 100, 132, 42, 98, 25, 98, 23, 169, 140, 109, 96, 111, 18, 81, 0, 104, 74, 37, 81, 90, 21, 166, 106, 191, 170, 44, 6, 90, 174, 44, 195, 88, 154, 64, 112, 33, 61, 141, 98, 14, 91, 59, 137, 150, 118, 114, 55, 36, 108, 83, 144}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n";</pre> LLNode* newhead = reverseLinkedList(head); LLNode::printList(newhead); newhead->clear();

174, 108, 90, 187, 13, 125, 172, 7, 13, 48, 52, 198, 177, 26, 9, 34, 56, 91, 166, 187, 130, 55, 94, 178, 10, 1 ...snip..., 10, 178, 94, 55, 130, 187, 166, 91, 56, 34, 9, 26, 177, 198, 52, 48, 13, 7, 172, 125, 13, 187, 90, 108, 174, 157, 37, 30, 107, 52, 136, 147, 141, 177, 181, 107, 134, 164, 34, 176, 46, 168, 75, 167, 181, 44, 136, 111, 106, 12, 89, 90, 131, 104, 38, 11, 6, 148, 107, 135, 119, 81, 20, 71, 67, 67, 173, 54, 108, 99, 134, 183, 158, 175, 61, 97, 49, 167, 11, 87, 159, 49, 99, 18, 0, 128, 40, 160, 132, 97, 14, 65, 185, 120, 195, 160, 38, 170, 79, 88, 174, 114, 42, 169, 32, 136, 5, 186, 94, 31, 156, 95, 45, 199, 122, 93, 172, 12, 157, 180, 0, 93, 131, 165, 136, 16, 149, 86, 52, 20, 66, 122, 82, 160, 143, 29, 60, 179, 149, 87, 100, 68, 132, 32, 58, 52, 111, 92, 103, 138, 199, 39, 82, 134, 92, 171, 75, 16, 112, 32, 29, 171, 198, 60, 90, 53, 68, 36, 121, 112, 93, 51, 155, 7, 41, 97, 142, 122, 41, 14, 185, 91, 149, 144, 97, 5, 96, 74, 107, 98, 62, 150, 179, 53, 100, 61, 92, 8, 193, 165, 17, 96, 196, 180, 114, 110, 101, 67, 35, 64, 184, 148, 145, 119, 7, 176, 191, 75, 167, 59, 40, 109, 86, 105, 125, 20, 91, 46, 185, 11, 103, 137, 130, 169, 146, 170, 139, 2, 104, 157, 119, 85, 109, 142, 185, 71, 150, 158, 122, 190, 26, 133, 186, 89, 17, 33, 114, 135, 19, 23, 0, 173, 28, 176, 133, 125, 63, 174, 124, 12, 57, 24, 3, 11, 174, 99, 167, 193, 129, 51, 42, 184, 152, 193, 192, 182, 166, 77, 147, 45, 61, 159, 75, 6, 83, 81, 186, 98, 92, 136, 38, 130, 40, 132, 111, 145, 174, 84, 100, 199, 176, 126, 185, 199, 57, 94, 12, 164, 189, 22, 8, 48, 120, 110, 48, 158, 17, 61, 64, 146, 72, 55, 81, 182, 149, 184, 91, 175, 122, 144, 23, 63, 4, 160, 174, 69, 78, 117, 28, 139, 118, 59, 169, 87, 60, 157, 64, 37, 32, 27, 169, 4, 139, 188,

134, 107, 181, 177, 141, 147, 136, 52, 107, 30, 37, 157, 174, 108, 90, 187, 13, 125, 172, 7, 13, 48, 52, 198, 177, 26, 9, 34, 56, 91, 166, 187, 130, 55, 94, 178, 10, 1 ...snip..., 10, 178, 94, 55, 130, 187, 166, 91, 56, 34, 9, 26, 177, 198, 52, 48, 13, 7, 172, 125, 13, 187, 90, 108, 174, 157, 37, 30, 107, 52, 136, 147, 141, 177, 181, 107, 134, 164, 34, 176, 46, 168, 75, 167, 181, 44, 136, 111, 106, 12, 89, 90, 131, 104, 38, 11, 6, 148, 107, 135, 119, 81, 20, 71, 67, 67, 173, 54, 108, 99, 134, 183, 158, 175, 61, 97, 49, 167, 11, 87, 159, 49, 99, 18, 0, 128, 40, 160, 132, 97, 14, 65, 185, 120, 195, 160, 38, 170, 79, 88, 174, 114, 42, 169, 32, 136, 5, 186, 94, 31, 156, 95, 45, 199, 122, 93, 172, 12, 157, 180, 0, 93, 131, 165, 136, 16, 149, 86, 52, 20, 66, 122, 82, 160, 143, 29, 60, 179, 149, 87, 100, 68, 132, 32, 58, 52, 111, 92, 103, 138, 199, 39, 82, 134, 92, 171, 75, 16, 112, 32, 29, 171, 198, 60, 90, 53, 68, 36, 121, 112, 93, 51, 155, 7, 41, 97, 142, 122, 41, 14, 185, 91, 149, 144, 97, 5, 96, 74, 107, 98, 62, 150, 179, 53, 100, 61, 92, 8, 193, 165, 17, 96, 196, 180, 114, 110, 101, 67, 35, 64, 184, 148, 145, 119, 7, 176, 191, 75, 167, 59, 40, 109, 86, 105, 125, 20, 91, 46, 185, 11, 103, 137, 130, 169, 146, 170, 139, 2, 104, 157, 119, 85, 109, 142, 185, 71, 150, 158, 122, 190, 26, 133, 186, 89, 17, 33, 114, 135, 19, 23, 0, 173, 28, 176, 133, 125, 63, 174, 124, 12, 57, 24, 3, 11, 174, 99, 167, 193, 129, 51, 42, 184, 152, 193, 192, 182, 166, 77, 147, 45, 61, 159, 75, 6, 83, 81, 186, 98, 92, 136, 38, 130, 40, 132, 111, 145, 174, 84, 100, 199, 176, 126, 185, 199, 57, 94, 12, 164, 189, 22, 8, 48, 120, 110, 48, 158, 17, 61, 64, 146, 72, 55, 81, 182, 149, 184, 91, 175, 122, 144, 23, 63, 4, 160, 174, 69, 78, 117, 28, 139, 118, 59, 169, 87, 60, 157, 64, 37, 32, 27, 169, 4, 139, 188, 92, 23, 192, 60, 39, 5, 68, 160, 82, 99, 132, 105, 80, 169, 46, 198, 169, 115, 2, 53,

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92, 23, 192, 60, 39, 5, 68,

160, 82, 99, 132, 105, 80,

169, 46, 198, 169, 115, 2, 53,

Test	Expected	Got
	157, 26, 9, 172, 99, 156, 71, 36, 83, 191, 21, 86, 17, 108, 18, 145, 42, 19, 51, 132, 155, 50, 192, 152, 0, 59, 89, 128, 27, 196, 160, 44, 149, 105, 24, 18, 137, 121, 22, 151,	157, 26, 9, 172, 99, 156, 71, 36, 83, 191, 21, 86, 17, 108, 18, 145, 42, 19, 51, 132, 155, 50, 192, 152, 0, 59, 89, 128, 27, 196, 160, 44, 149, 105, 24, 18, 137, 121, 22, 151,
	111, 109, 111, 86, 30, 159, 59, 135, 6, 185, 40, 147, 27, 188, 33, 165, 14, 82, 95, 28, 97, 87, 65, 79, 146, 52, 152, 80, 130, 173, 54, 5, 77, 109, 128, 51, 148, 63, 185, 93, 153, 55, 33, 189, 50, 88, 174	111, 109, 111, 86, 30, 159, 59, 135, 6, 185, 40, 147, 27, 188, 33, 165, 14, 82, 95, 28, 97, 87, 65, 79, 146, 52, 152, 80, 130, 173, 54, 5, 77, 109, 128, 51, 148, 63, 185, 93, 153, 55, 33, 189, 50, 88, 174
	153, 55, 33, 189, 50, 88, 174, 153, 58, 64, 49, 105, 117, 122, 91, 110, 130, 108, 74, 69, 197, 120, 110, 78, 124, 23, 153, 70, 91, 4, 150, 28, 163, 125, 89, 163, 16, 24, 15, 28, 115, 44, 94, 24, 85, 71,	153, 55, 33, 189, 50, 88, 174, 153, 58, 64, 49, 105, 117, 122, 91, 110, 130, 108, 74, 69, 197, 120, 110, 78, 124, 23, 153, 70, 91, 4, 150, 28, 163, 125, 89, 163, 16, 24, 15, 28, 115, 44, 94, 24, 85, 71,
1 H	0, 35, 5, 95, 125, 18, 99, 35, 47, 185, 118, 99, 161, 119, 10, 134, 17, 156, 134, 11, 61, 101, 117, 99, 4, 46, 163, 46, 71, 176, 10, 68, 160, 19, 165, 54, 177, 87, 28, 188, 167,	0, 35, 5, 95, 125, 18, 99, 35, 47, 185, 118, 99, 161, 119, 10, 134, 17, 156, 134, 11, 61, 101, 117, 99, 4, 46, 163, 46, 71, 176, 10, 68, 160, 19, 165, 54, 177, 87, 28, 188, 167,
Ø CHIK.	118, 73, 33, 88, 133, 99, 37, 163, 132, 17, 178, 63, 18, 48, 153, 198, 133, 160, 174, 115, 106, 68, 179, 17, 41, 184, 137, 22, 123, 152, 149, 48, 142, 62, 73, 102, 137, 52, 161, 171, 52, 147, 136, 6,	118, 73, 33, 88, 133, 99, 37, 163, 132, 17, 178, 63, 18, 48, 153, 198, 133, 160, 174, 115, 106, 68, 179, 17, 41, 184, 137, 22, 123, 152, 149, 48, 142, 62, 73, 102, 137, 52, 161, 171, 52, 147, 136, 6,
TÀI LIÍ	163, 10, 154, 196, 28, 19, 149, 186, 53, 170, 2, 165, 82, 64, 17, 53, 198, 135, 189, 49, 97, 5, 147, 60, 82, 198, 122, 41, 85, 117, 15, 26, 168, 172, 71, 15, 169, 172, 73, 44, 178, 134, 35, 108, 1, 51, 12, 21,	163, 10, 154, 196, 28, 19, 149, 186, 53, 170, 2, 165, 82, 64, 17, 53, 198, 135, 189, 49, 97, 5, 147, 60, 82, 198, 122, 41, 85, 117, 15, 26, 168, 172, 71, 15, 169, 172, 73, 44, 178, 134, 35, 108, 1, 51, 12, 21,
	10, 48, 139, 139, 94, 14, 0, 153, 73, 73, 0, 149, 111, 103, 125, 92, 24, 3, 38, 110, 77, 75, 131, 106, 33, 110, 109, 92, 28, 49, 124, 38, 12, 132, 137, 197, 190, 17, 22, 62, 141, 13, 167, 48, 113, 160	10, 48, 139, 139, 94, 14, 0, 153, 73, 73, 0, 149, 111, 103, 125, 92, 24, 3, 38, 110, 77, 75, 131, 106, 33, 110, 109, 92, 28, 49, 124, 38, 12, 132, 137, 197, 190, 17, 22, 62,
	141, 13, 107, 48, 113, 169, 92, 163, 115, 50, 56, 185, 7, 63, 59, 187, 193, 155, 183, 111, 67, 84, 104, 81, 151, 131, 14, 15, 177, 197, 190, 65, 143, 25, 156, 137, 116, 98, 90, 127, 114, 88, 189, 88,	141, 13, 107, 48, 113, 169, 92, 163, 115, 50, 56, 185, 7, 63, 59, 187, 193, 155, 183, 111, 67, 84, 104, 81, 151, 131, 14, 15, 177, 197, 190, 65, 143, 25, 156, 137, 116, 98, 90, 127, 114, 88, 189, 88,
	23, 65, 106, 95, 27, 93, 155, 4, 199, 99, 151, 53, 192, 125, 2, 98, 158, 155, 129, 100, 55, 119, 89, 128, 88, 60, 145, 169, 85, 132, 70, 76, 167, 25, 70, 199, 190, 52, 184, 188,	23, 65, 106, 95, 27, 93, 155, 4, 199, 99, 151, 53, 192, 125, 2, 98, 158, 155, 129, 100, 55, 119, 89, 128, 88, 60, 145, 169, 85, 132, 70, 76, 167, 25, 70, 199, 190, 52, 184, 188,
	144, 53, 147, 50, 162, 130, 197, 125, 173, 147, 45, 71, 180, 173, 83, 174, 68, 77, 96, 199, 115, 167, 193, 156, 148, 175, 33, 98, 99, 96, 62, 54, 125, 131, 155, 64, 179, 66,	144, 53, 147, 50, 162, 130, 197, 125, 173, 147, 45, 71, 180, 173, 83, 174, 68, 77, 96, 199, 115, 167, 193, 156, 148, 175, 33, 98, 99, 96, 62, 54, 125, 131, 155, 64, 179, 66,
D.A.	63, 192, 7, 149, 60, 136, 78,	63, 192, 7, 149, 60, 136, 78,

Test	Expected	Got
	172, 115, 10, 168, 158, 63,	172, 115, 10, 168, 158, 63,
	28, 117, 81, 24, 40, 89, 67,	28, 117, 81, 24, 40, 89, 67,
	57, 184, 89, 160, 13, 10, 15,	57, 184, 89, 160, 13, 10, 15,
	37, 23, 152, 147, 188, 96, 99,	37, 23, 152, 147, 188, 96, 99,
	116, 88, 13, 121, 167, 67, 24,	116, 88, 13, 121, 167, 67, 24,
	180, 45, 199, 86, 85, 58, 98,	180, 45, 199, 86, 85, 58, 98,
	121, 25, 148, 172, 24, 146,	121, 25, 148, 172, 24, 146,
	193, 149, 61, 72, 117, 59, 79,	193, 149, 61, 72, 117, 59, 79,
	162, 100, 89, 88, 167, 99, 14,	162, 100, 89, 88, 167, 99, 14,
	55, 178, 20, 116, 49, 173, 27,	55, 178, 20, 116, 49, 173, 27,
	183, 117, 4, 99, 145, 46, 46,	183, 117, 4, 99, 145, 46, 46,
	61, 116, 125, 31, 195, 103,	61, 116, 125, 31, 195, 103,
	30, 137, 184, 36, 67, 68]	30, 137, 184, 36, 67, 68]

Passed all tests! 🗸

Chính xác

Điểm cho bài nộp này: 1,00/1,00.



Câu hỏi 8 Chính xác Điểm 1,00 của 1,00

Class LinkedList is used to represent single linked list, described as the following:

```
class LinkedList {
  public:
     class Node;
  private:
     Node* head;
     Node* tail;
     int size;
  public:
     class Node {
       private:
          int value;
          Node* next;
          friend class LinkedList;
       public:
          Node() {
            this->next = NULL;
         }
          Node(Node* node) {
            this->value = node->value;
            this->next = node->next;
         }
          Node(int value, Node* next = NULL) {
            this->value = value;
            this->next = next;
         }
     };
     LinkedList(): head(NULL), tail(NULL), size(0) {};
                                                       BŐI HCMUT-CNCP
     void partition(int k);
};
```

In this class; head, tail and size are the pointers of the first element, the last element and size of linked list.

Request: Implement function

void LinkedList::partition(int k);

To rearrange elements in this linked list by this way: split all elements of this linked list to 3 groups include: group I (the value of each element is smaller than k), group II (the value of each element is equal to k) and group III (the value of each element is larger than k); after that, move group I to the head of linked list, group II is after group I and group III is after group II. Note that the orders of the elements of each group are unchanged.

Example:

```
- The given linked list: 10->55->45->42->50
- k=45
```

In this case, group I includes elements with value 10 and 42, group II includes elements with 45 and group III includes elements with value 55 and 50. Rearrange by above way, this linked list will become 10->42->45->55->50 (the orders of th elements in each group is unchanged: 10 before 42 and 55 before 50).

Note: In this exercise, libraries iostream, sstream and using namespace std; have been used. You can add other functions for your answer, but you are not allowed to add other libraries.

For example:

Test	Result
LinkedList* l1 = new LinkedList(); l1->add(20); l1->add(30); l1->add(10); l1->add(60); l1->add(40); l1->add(45); l1->add(55); l1->partition(45); cout << l1->toString() << "\n";	[20,30,10,40,45,60,55]

Answer: (penalty regime: 0 %)

Reset answer

```
1
 2
 3
    void LinkedList::partition(int k) {
        if(size == 0 || size == 1) return;
 4
         /*Node* tag = head;
 5
        while(tag->next->value != k) tag = tag->next;
 6
 7
        Node* leftT = tag;
 8
        tag = tag->next;
 9
        Node* rightH = tag->next;
10
         //isolation tag
11
        leftT->next = nullptr;
        tag->next = nullptr;*/
12
        Node* tmp;
13
14
         LinkedList* group1 = new LinkedList();
        LinkedList* group2 = new LinkedList();
LinkedList* group3 = new LinkedList();
15
16
        while(head!=nullptr){
17
18
             //isolation
19
             tmp = head;
20
             head = head->next;
21
             tmp->next = nullptr;
22
             //add
23
             LinkedList* tmpGroup;
24
             if(tmp->value < k ) tmpGroup = group1;</pre>
25
             if(tmp->value == k) tmpGroup = group2;
             if(tmp->value > k ) tmpGroup = group3;
26
27
             if(tmpGroup->size == 0){
28
29
                 tmpGroup->head = tmpGroup->tail =
                                                     tmp;
30
                 tmpGroup->size++;
31
                                             BŐI HCMUT-CNCP
32
             else{
                 tmpGroup->tail->next = tmp;
33
34
                 tmpGroup->tail = tmp;
35
                 tmpGroup->size++;
36
37
         if(group1->size) {
38
39
             head = group1->head;
40
             if(group2->size) {
41
                 group1->tail->next = group2->head;
42
                 if(group3->size) {
43
                     group2->tail->next = group3->head;
44
                     tail = group3->tail;
45
                 } else tail = group2->tail;
46
             } else {
47
                 if(group3->size) {
                     group1->tail->next = group3->head;
48
49
                     tail = group3->tail;
50
                 } else tail = group1->tail;
51
52
         } else{
             if(group2->size){
53
54
                 head = group2->head;
55 1
                 if(group3->size){
56
                     group2->tail->next = group3->head;
                     tail = group3->tail;
57
58
                 } else tail = group2->tail;
59
             } else{
60 ▼
                 if(group3->size){
```

```
61
                     head = group3->head;
62
                     tail = group3->tail;
63
                } else;
64
65
        //delete group1;
66
        //delete group2;
67
        //delete group3;
68
69
```

	Test	Expected	Got	
*	<pre>LinkedList* 11 = new LinkedList(); 11->add(20); 11->add(30); 11->add(10); 11->add(60); 11->add(40); 11- >add(45); 11->add(55); 11->partition(45); cout << 11->toString() << "\n";</pre>	[20,30,10,40,45,60,55]	[20,30,10,40,45,60,55]	~

Chính xác

Điểm cho bài nộp này: 1,00/1,00.



Câu hỏi 9 Chính xác Điểm 1,00 của 1,00

Polynomials is an important application of arrays and linked lists. A polynomial is composed of different terms where each of them holds a coefficient and an exponent. A polynomial p(x) is the expression in variable x which is in the form $(a_nx^n + a_{n-1}x^{n-1} + + a_1x + a_0)$, where a_n , a_{n-1} ,, a_0 fall in the category of real numbers and 'n' is the non-negative integer, which is called the degree of polynomial.

Example: $10x^2 + 26x$, here 10 and 26 are coefficients and 2, 1 is its exponential value.

Points to keep in Mind while working with Polynomials:

- The sign of each coefficient and exponent is stored within the coefficient and the exponent itself.
- The storage allocation for each term in the polynomial must be done in descending order of their exponent.

In this question, complete SLinkedList class is included. You should use this class to complete your Polynomial class with initialized frame as following. This task is implement insertTerm to insert a term into a polynomial.

```
class Polynomial;
class Term {
private:
    double coeff:
    int exp;
    friend class Polynomial;
public:
        this->coeff = coeff;
        this->exp = exp;
    }
   bool operator==(const Term& rhs) const {
        return this->coeff == rhs.coeff && this->exp == rhs.exp;
    }
    friend ostream & operator<<(ostream &os, const Term& term) {</pre>
        cout << "Term: " << "(" << term.coeff <<</pre>
        return os;
    }
};
class Polynomial {
private:
    SLinkedList<Term>* terms;
public:
    Polynomial() {
        this->terms = new SLinkedList<Term>();
    ~Polynomial() {
        this->terms->clear();
   void insertTerm(const Term& term);
    void insertTerm(double coeff, int exp);
    void print() {
        SLinkedList<Term>::Iterator it;
        cout << "[";
        for (it = this->terms->begin(); it != this->terms->end(); it++) {
            cout << (*it);
        cout << endl << "]";
    }
};
```

For example:

Test	Result
Polynomial *poly = new Polynomial();	[
poly->insertTerm(6.0, 2);	Term: (10 5)
<pre>poly->insertTerm(4.0, 5);</pre>	Term: (4 3)
<pre>poly->insertTerm(4.0, 3);</pre>	Term: (6 2)
<pre>poly->insertTerm(6.0, 5);</pre>	Term: (-1 0)
<pre>poly->insertTerm(-1.0, 0);</pre>]
<pre>poly->insertTerm(-6.0, 6);</pre>	
<pre>poly->insertTerm(6.0, 6);</pre>	
<pre>poly->print();</pre>	
int n = 5;	[
int coeff[] = { 1, 2, 3, 4, 5 };	Term: (5 5)
int exp[] = { 1, 2, 3, 4, 5 };	Term: (4 4)
	Term: (3 3)
Polynomial p1;	Term: (2 2)
for (int i = 0; i < n; ++i)	Term: (1 1)
<pre>p1.insertTerm(coeff[i], exp[i]);</pre>]
p1.print();	

Answer: (penalty regime: 0, 0, 0, 5, 10 %)

```
Reset answer
     void Polynomial::insertTerm(const Term& term) {
         // STUDENT ANSWER
  2
  3
         if(term.coeff == 0) return;
  4
         if(terms->size() == 0){
             terms->add(term);
  5
  6
             return;
  7
  8
         SLinkedList<Term>::Iterator tmp;
  9
         tmp = terms->begin();
 10
         while(tmp != terms->end()) {
             if(term.exp < (*tmp).exp) tmp++;</pre>
 11
 12
             else break;
 13
 14
         if(!(tmp != terms->end())){
 15
             terms->add(term);
                                             BỞI HCMUT-CNCP
16
             return;
17
18
         if(term.exp > (*tmp).exp) terms->add(terms->indexOf(*tmp),term);
 19
         else {
 20
             if((*tmp).coeff + term.coeff == 0) terms->removeAt(terms->indexOf(*tmp));
 21
             else (*tmp).coeff += term.coeff;
         }
 22
 23
 24
 25
     void Polynomial::insertTerm(double coeff, int exp) {
 26
         // STUDENT ANSWER
         Term term = Term(coeff,exp);
 27
 28
         this->insertTerm(term);
 29
 30
 31
     term = data
     SLinkedList() : head(NULL), tail(NULL), count(0){};
 32
         ~SLinkedList();
 33
 34
         void add(const T &e);
         void add(int index, const T &e);
 35
 36
         T removeAt(int index);
 37
         bool removeItem(const T &removeItem);
         bool empty();
 38
         int size();
39
40
         void clear();
 41
         T get(int index);
 42
         void set(int index, const T &e);
43
         int indexOf(const T &item);
44
         bool contains(const T &item);
```

```
SCLITLIS COSCLITLIS()
ر+
46
        SLinkedList(const SLinkedList &list)
47
48
            this->count = 0;
            this->head = NULL;
49
50
            this->tail = NULL;
51
        Iterator begin()
52
53 🔻
        {
            return Iterator(this, true);
54
55
56
        Iterator end()
57 •
        {
58
            return Iterator(this, false);
59
        class Iterator
60
61
        private:
            SLinkedList<T> *pList;
62
```

	Test	Expected	Got	
~	Polynomial *poly = new Polynomial();	[Г	~
	<pre>poly->insertTerm(6.0, 2);</pre>	Term: (10 5)	Term: (10 5)	
	<pre>poly->insertTerm(4.0, 5);</pre>	Term: (4 3)	Term: (4 3)	
	<pre>poly->insertTerm(4.0, 3);</pre>	Term: (6 2)	Term: (6 2)	
	<pre>poly->insertTerm(6.0, 5);</pre>	Term: (-1 0)	Term: (-1 0)	$V \cap$
	<pre>poly->insertTerm(-1.0, 0);</pre>	1 7/2,]	-
	<pre>poly->insertTerm(-6.0, 6);</pre>	C.X.		
	<pre>poly->insertTerm(6.0, 6);</pre>			
	poly->print();	X		
~	int n = 5;	9		~
	int coeff[] = { 1, 2, 3, 4, 5 };	Term: (5 5)	Term: (5 5)	0
	int exp[] = { 1, 2, 3, 4, 5 };	Term: (4 4)	Term: (4 4)	
		Term: (3 3)	Term: (3 3)	
	Polynomial p1;	Term: (2 2)	Term: (2 2)	
	for (int i = 0; i < n; ++i)	Term: (1 1)	Term: (1 1)	
	p1.insertTerm(coeff[i], exp[i]);	Al LI	EU SL	ľし
	p1.print();	ВďІ	HCMUT-	CNO

Chính xác

Điểm cho bài nộp này: 1,00/1,00.

Câu hỏi 10

Chính xác

Điểm 1,00 của 1,00

Cho node root của một danh sách liên kết đơn, hiện thực hàm sau đây:

```
void reduceDuplicate(Node* root);
```

để giảm các phần tử trùng lặp liên tiếp trong danh sách. Nếu có các phần tử liên tiếp giống nhau, ta chỉ giữ lại 1 phần tử. Ví dụ, ta có 1 danh sách 122234452, sau khi thực hiện hàm reduceDuplicate ta thu được danh sách 123452. (số 2 cuối cùng giữ nguyên do nó không liên tiếp với dãy 222 phía trước)

Lưu ý: Các bạn có thể include thêm thư viện nếu cần thiết

Cấu trúc của một node được cho bên dưới. Các bạn chỉ cần viết nội dung hàm reduceDuplicate, các cấu trúc khác đã được import sẵn.

```
class Node
    int data;
    Node* next;
public:
    Node(): data(0), next(nullptr){}
    Node(int data, Node* next)
    {
        this->data = data;
        this->next = next;
    }
    int getData()
    {
        return this->data;
    }
                                            BỞI HCMUT-CNCP
    void setData(int data)
    {
        this->data = data;
    }
    Node* getNext()
        return this->next;
    }
    void setNext(Node* next)
    {
        this->next = next;
    }
};
```

For example:

Test	Result
Node* node1 = new Node(1, nullptr); Node* node2 = new Node(1, node1);	HEAD -> 0 -> 1 -> 1 -> NULL
Node* node3 = new Node(0, node2); printList(node3);	
<pre>reduceDuplicate(node3); printList(node3);</pre>	

Answer: (penalty regime: 0, 0, 0, 100 %)

```
Reset answer
    void reduceDuplicate(Node* root)
 1
 2 •
 3
        Node* currentNode = root;
 4
        Node* nextNode = root->getNext();
        while(nextNode != nullptr){
 5
 6
             if(currentNode->getData() == nextNode->getData()){
 7
                 currentNode->setNext(nextNode->getNext());
 8
                 Node* tmp = nextNode;
                 nextNode = nextNode->getNext();
 9
10
                 delete tmp;
11
12 •
             else{
13
                 currentNode = nextNode;
                 nextNode = nextNode->getNext();
14
15
16
         }
17
                                           BổI HCMUT-CNCP
```

	Test	Expected	Got	
~	Node* node1 = new Node(1, nullptr); Node* node2 = new Node(1, node1); Node* node3 = new Node(0, node2); printList(node3); reduceDuplicate(node3); printList(node3);	HEAD -> 0 -> 1 -> 1 -> NULL HEAD -> 0 -> 1 -> NULL	HEAD -> 0 -> 1 -> 1 -> NULL HEAD -> 0 -> 1 -> NULL	~

Chính xác

Điểm cho bài nộp này: 1,00/1,00.



Câu hỏi 11

Chính xác

Điểm 1,00 của 1,00

Class LLNode representing a node of singly linked lists is declared as below:

```
class LLNode {
public:
    int val;
    LLNode* next;
    LLNode(); // Constructor: val = 0, next = nullptr
    LLNode(int val, LLNode* next); // Constructor with customized data
```

Given a singly linked list head node.

Your task is to implement a function with following prototype:

```
LLNode* foldLinkedList(LLNode* head);
```

The function returns head node of the folded singly linked list.

More info:

A folded singly linked list is achieved by taking the first half of the linked list and folding over the second half and merging the intersecting nodes by taking their sum.

Note:

- The iostream library has been used and namespace std is being used. No other libraries are allowed.
- The constructors and methods of class LLNode have been defined fully so you do not need to redefine them.
- You can write helper functions.

For example:

Test	Result
cout << "\n";	[9, 5, 7, 5, 0] [7, 10, 9] [8]
<pre>int arr[] = {8, 4, 6, 8, 5, 3}; LLNode* head = LLNode::createWithIterators(arr, arr + size LLNode::printList(head); cout << "\n"; LLNode* newhead = foldLinkedList(head); LLNode::printList(newhead);</pre>	[8, 4, 6, 8, 5, 3 eof(arr) / sizeof(int)); [14, 9, 11]

Answer: (penalty regime: 0 %)

Reset answer

```
1 | LLNode* getNode(int index,LLNode* head){
        LLNode* tmp = head;
 2
 3
        if(index == 0) return head;
 4
        int result = 0;
 5
        while(result != index){
 6
            tmp = tmp->next;
 7
            result++;
 8
        }
 9
        return tmp;
10
    }
11
    LLNode* foldLinkedList(LLNode* head) {
12
13
        if(head == nullptr) return nullptr;
14
        LLNode* tmp = head;
```

```
while(tmp != nullptr) {
15
16 •
17
            tmp = tmp->next;
18
            count++;
19
        }
20 🔻
        if(count == 1) {
            LLNode* newHead = new LLNode(head->val,nullptr);
21
22
            return newHead;
```

	Test	Expected	Got	
~	<pre>int arr[] = {9, 5, 7, 5, 0}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = foldLinkedList(head); LLNode::printList(newhead);</pre>	[9, 5, 7, 5, 0] [7, 10, 9]	[9, 5, 7, 5, 0] [7, 10, 9]	~
*	<pre>int arr[] = {8, 4, 6, 8, 5, 3}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = foldLinkedList(head); LLNode::printList(newhead);</pre>	[8, 4, 6, 8, 5, 3] [14, 9, 11]	[8, 4, 6, 8, 5, 3] [14, 9, 11]	~
*	<pre>int arr[] = {}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = foldLinkedList(head); LLNode::printList(newhead);</pre>	CP CO 3		~
~	<pre>int arr[] = {7, 3, 1, 9, 4, 6, 3, 8, 5, 5}; LLNode* head = LLNode::createWithIterators(arr, arr) + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = foldLinkedList(head); LLNode::printList(newhead);</pre>	[7, 3, 1, 9, 4, 6, 3, 8, 5, 5] [10, 12, 9, 8, 12] CMUT-CNCP	[7, 3, 1, 9, 4, 6, 3, 8, 5, 5] [10, 12, 9, 8, 12]	~
*	<pre>int arr[] = {8, 6, 9, 7, 3, 7, 6, 0, 3, 2, 2, 4, 6, 3, 6, 4, 2, 8, 3, 4, 2, 9, 4, 9, 5, 8, 5, 6, 9, 1, 5, 5, 9, 3, 1, 4, 2, 0, 1, 5, 1, 2, 9, 5, 0, 5, 3, 5, 1, 0, 6, 7, 3, 0, 9, 4, 0, 6, 0, 1, 3, 2, 9, 6, 6, 4, 4, 1, 5, 9, 6, 1, 1, 7, 9, 7, 7, 5, 1, 8, 4, 1, 4, 3, 0, 7, 7, 7, 9, 2, 9, 4, 2, 1, 2, 5, 7, 6, 5, 3, 1, 7, 2, 4, 3}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int)); LLNode::printList(head); cout << "\n"; LLNode* newhead = foldLinkedList(head); LLNode::printList(newhead);</pre>	[8, 6, 9, 7, 3, 7, 6, 0, 3, 2, 2, 4, 6, 3, 6, 4, 2, 8, 3, 4, 2, 9, 4, 9, 5, 8, 5, 6, 9, 1, 5, 5, 9, 3, 1, 4, 2, 0, 1, 5, 1, 2, 9, 5, 0, 5, 3, 5, 1, 0, 6, 7, 3, 0, 9, 4, 0, 6, 0, 1, 3, 2, 9, 6, 6, 4, 4, 1, 5, 9, 6, 1, 1, 7, 9, 7, 7, 5, 1, 8, 4, 1, 4, 3, 0, 7, 7, 7, 9, 2, 9, 4, 2, 1, 2, 5, 7, 6, 5, 3, 1, 7, 2, 4, 3] [3, 7, 15, 4, 1, 11, 3, 6, 3, 7, 18, 8, 7, 9, 5, 1, 7, 13, 7, 4, 10, 12, 14, 8, 16, 11, 6, 16, 9, 10, 8, 12, 2, 11, 10, 15, 11, 6, 15, 7, 8, 5, 4, 7, 10, 6, 11, 10, 4, 14, 11, 10, 11]	[8, 6, 9, 7, 3, 7, 6, 0, 3, 2, 2, 4, 6, 3, 6, 4, 2, 8, 3, 4, 2, 9, 4, 9, 5, 8, 5, 6, 9, 1, 5, 5, 9, 3, 1, 4, 2, 0, 1, 5, 1, 2, 9, 5, 0, 5, 3, 5, 1, 0, 6, 7, 3, 0, 9, 4, 0, 6, 0, 1, 3, 2, 9, 6, 6, 4, 4, 1, 5, 9, 6, 1, 1, 7, 9, 7, 7, 5, 1, 8, 4, 1, 4, 3, 0, 7, 7, 7, 9, 2, 9, 4, 2, 1, 2, 5, 7, 6, 5, 3, 1, 7, 2, 4, 3] [3, 7, 15, 4, 1, 11, 3, 6, 3, 7, 18, 8, 7, 9, 5, 1, 7, 13, 7, 4, 10, 12, 14, 8, 16, 11, 6, 16, 9, 10, 8, 12, 2, 11, 10, 15, 11, 6, 15, 7, 8, 5, 4, 7, 10, 6, 11, 10, 4, 14, 11, 10, 11]	•

	Test	Expected	Got	
~	int arr[] = {5, 8, 9, 4, 1, 3, 8, 2, 3, 3, 5, 5, 6,	[5, 8, 9, 4, 1, 3, 8, 2, 3, 3,	[5, 8, 9, 4, 1, 3, 8, 2, 3, 3,	~
	8, 8, 7, 4, 8, 1, 5, 8, 5, 2, 5, 0, 9, 7, 0, 8, 1,	5, 5, 6, 8, 8, 7, 4, 8, 1, 5,	5, 5, 6, 8, 8, 7, 4, 8, 1, 5,	
	1, 3, 4, 8, 4, 0, 5, 1, 6, 6, 0, 2, 5, 2, 8, 2, 0, 8, 3, 0, 9, 4, 5, 2, 9, 3, 2, 2, 7, 0, 3, 7, 7, 2,	8, 5, 2, 5, 0, 9, 7, 0, 8, 1, 1, 3, 4, 8, 4, 0, 5, 1, 6, 6,	8, 5, 2, 5, 0, 9, 7, 0, 8, 1, 1, 3, 4, 8, 4, 0, 5, 1, 6, 6,	
	8, 0, 7, 4, 5, 9, 7, 2, 6, 3, 4, 3, 1, 2, 2, 6, 2,	0, 2, 5, 2, 8, 2, 0, 8, 3, 0,	0, 2, 5, 2, 8, 2, 0, 8, 3, 0,	
	7, 3, 1, 9, 7, 1, 9, 6, 2, 6, 8, 1, 1, 2, 9, 7, 6,	9, 4, 5, 2, 9, 3, 2, 2, 7, 0,	9, 4, 5, 2, 9, 3, 2, 2, 7, 0,	
	8, 6, 2, 9, 0, 8, 9, 0, 3, 0, 1, 6, 4, 3, 4, 5, 1,	3, 7, 7, 2, 8, 0, 7, 4, 5, 9,	3, 7, 7, 2, 8, 0, 7, 4, 5, 9,	
	8, 0, 6, 8, 2, 2, 3, 4, 3, 0, 5, 5, 1, 9, 8, 4, 9, 4, 9, 8, 9, 7, 6, 1, 3, 8, 8, 6, 3, 0, 7, 3, 0, 9,	7, 2, 6, 3, 4, 3, 1, 2, 2, 6, 2, 7, 3, 1, 9, 7, 1, 9, 6, 2,	7, 2, 6, 3, 4, 3, 1, 2, 2, 6, 2, 7, 3, 1, 9, 7, 1, 9, 6, 2,	
	8, 1, 7, 8, 4, 8, 1, 4, 2, 2, 3, 8, 7, 2, 8, 0, 8,	6, 8, 1, 1, 2, 9, 7, 6, 8, 6,	6, 8, 1, 1, 2, 9, 7, 6, 8, 6,	
	8, 4, 2, 9, 5, 4, 2, 7, 6, 8, 4, 9, 6, 5, 1, 0, 5,	2, 9, 0, 8, 9, 0, 3, 0, 1, 6,	2, 9, 0, 8, 9, 0, 3, 0, 1, 6,	
	6, 7, 3, 2, 7, 0, 8, 7, 5, 0, 6, 3, 7, 5, 5, 9, 4, 5, 1, 4, 3, 6, 3, 2, 5, 9, 7, 8, 5, 0, 9, 1, 8, 7,	4, 3, 4, 5, 1, 8, 0, 6, 8, 2, 2, 3, 4, 3, 0, 5, 5, 1, 9, 8,	4, 3, 4, 5, 1, 8, 0, 6, 8, 2, 2, 3, 4, 3, 0, 5, 5, 1, 9, 8,	
	6, 1, 0, 5, 5, 7, 1, 8, 9, 8, 7, 7, 2, 9, 5, 8, 9,	4, 9, 4, 9, 8, 9, 7, 6, 1, 3,	4, 9, 4, 9, 8, 9, 7, 6, 1, 3,	
	3, 8, 4, 4, 7, 1, 7, 2, 6, 1, 6, 8, 8, 8, 7, 0, 8,	8, 8, 6, 3, 0, 7, 3, 0, 9, 8,	8, 8, 6, 3, 0, 7, 3, 0, 9, 8,	
	0, 5, 6, 8, 6, 8, 8, 4, 0, 6, 7, 5, 3, 6, 6, 2, 1,	1, 7, 8, 4, 8, 1, 4, 2, 2, 3, 8, 7, 2, 8, 0, 8, 8, 4, 2, 9,	1, 7, 8, 4, 8, 1, 4, 2, 2, 3,	
	9, 1, 9, 3, 0, 5, 5, 2, 1, 2, 7, 4, 9, 6, 6, 5, 3, 5, 6, 9, 8, 6, 8, 2, 7, 3, 4, 2, 6, 3, 0, 5, 9, 0,	5, 4, 2, 7, 6, 8, 4, 9, 6, 5,	8, 7, 2, 8, 0, 8, 8, 4, 2, 9, 5, 4, 2, 7, 6, 8, 4, 9, 6, 5,	
	9, 9, 7, 0, 8, 6, 9, 8, 7, 8, 4, 0, 8, 0, 3, 0, 1,	1, 0, 5, 6, 7, 3, 2, 7, 0, 8,	1, 0, 5, 6, 7, 3, 2, 7, 0, 8,	
	8, 4, 5, 0, 2, 7, 0, 7, 8, 4, 0, 3, 7, 5, 2, 5, 3,	7, 5, 0, 6, 3, 7, 5, 5, 9, 4,	7, 5, 0, 6, 3, 7, 5, 5, 9, 4,	
	9, 1, 2, 5, 1, 1, 2, 7, 4, 6, 1, 6, 3, 0, 2, 4, 8, 5, 9, 0, 6, 0, 1, 7, 4, 1, 5, 6, 3, 9, 5, 2, 7, 0,	5, 1, 4, 3, 6, 3, 2, 5, 9, 7, 8, 5, 0, 9, 1, 8, 7, 6, 1, 0,	5, 1, 4, 3, 6, 3, 2, 5, 9, 7, 8, 5, 0, 9, 1, 8, 7, 6, 1, 0,	
	4, 4, 0, 8, 5, 4, 8, 5, 0, 8, 9, 7, 3, 6, 4, 4, 5,	5, 5, 7, 1, 8, 9, 8, 7, 7, 2,	5, 5, 7, 1, 8, 9, 8, 7, 7, 2,	
	0, 5, 0, 7, 9, 3, 4, 7, 2, 7, 9, 2, 1, 0, 9, 1, 3,	9, 5, 8, 9, 3, 8, 4, 4, 7, 1,	9, 5, 8, 9, 3, 8, 4, 4, 7, 1,	
	8, 5, 9, 4, 0, 5, 9, 9, 5, 1, 1, 0, 2, 9, 8, 8, 8, 8, 8, 2, 2, 5, 8, 3, 0, 5, 9, 5, 8, 7, 0, 6, 6, 2,	7, 2, 6, 1, 6, 8, 8, 8, 7, 0, 8, 0, 5, 6, 8, 6, 8, 8, 4, 0,	7, 2, 6, 1, 6, 8, 8, 8, 7, 0, 8, 0, 5, 6, 8, 6, 8, 8, 4, 0,	
	3, 5, 9, 0, 1, 9, 7, 1, 4, 5, 1, 5, 5, 3, 7, 2, 6,	6, 7, 5, 3, 6, 6, 2, 1, 9, 1,	6, 7, 5, 3, 6, 6, 2, 1, 9, 1,	
	4, 1, 3, 2, 4, 6, 5, 2, 4, 1, 1, 3, 5, 6, 2, 0, 0,	9, 3, 0, 5, 5, 2, 1, 2, 7, 4,	9, 3, 0, 5, 5, 2, 1, 2, 7, 4,	
	5, 4, 7, 8, 4, 3, 1, 7, 1, 9, 3, 8, 0, 7, 8, 0, 3, 6, 3, 8, 0, 3, 1, 7, 2, 1, 7, 9};	9, 6, 6, 5, 3, 5, 6, 9, 8, 6,	9, 6, 6, 5, 3, 5, 6, 9, 8, 6,	
	LLNode* head = LLNode::createWithIterators(arr, arr	8, 2, 7, 3, 4, 2, 6, 3, 0, 5, 9, 0, 9, 9, 7, 0, 8, 6, 9, 8,	8, 2, 7, 3, 4, 2, 6, 3, 0, 5, 9, 0, 9, 9, 7, 0, 8, 6, 9, 8,	
	+ sizeof(arr) / sizeof(int));	7, 8, 4, 0, 8, 0, 3, 0, 1, 8,	7, 8, 4, 0, 8, 0, 3, 0, 1, 8,	
	<pre>LLNode::printList(head); cout << "\n";</pre>	4, 5, 0, 2, 7, 0, 7, 8, 4, 0,	4, 5, 0, 2, 7, 0, 7, 8, 4, 0,	
	LLNode* newhead = foldLinkedList(head);	3, 7, 5, 2, 5, 3, 9, 1, 2, 5, 1, 1, 2, 7, 4, 6, 1, 6, 3, 0,	3, 7, 5, 2, 5, 3, 9, 1, 2, 5, 1, 1, 2, 7, 4, 6, 1, 6, 3, 0,	
	LLNode::printList(newhead);	2, 4, 8, 5, 9, 0, 6, 0, 1, 7,	2, 4, 8, 5, 9, 0, 6, 0, 1, 7,	
	IAILIĖ	4, 1, 5, 6, 3, 9, 5, 2, 7, 0,	4, 1, 5, 6, 3, 9, 5, 2, 7, 0,	
	BỞL	4, 4, 0, 8, 5, 4, 8, 5, 0, 8, 9, 7, 3, 6, 4, 4, 5, 0, 5, 0,	4, 4, 0, 8, 5, 4, 8, 5, 0, 8, 9, 7, 3, 6, 4, 4, 5, 0, 5, 0,	
	5011	7, 9, 3, 4, 7, 2, 7, 9, 2, 1,	7, 9, 3, 4, 7, 2, 7, 9, 2, 1,	
		0, 9, 1, 3, 8, 5, 9, 4, 0, 5,	0, 9, 1, 3, 8, 5, 9, 4, 0, 5,	
		9, 9, 5, 1, 1, 0, 2, 9, 8, 8, 8, 8, 8, 2, 2, 5, 8, 3, 0, 5,	9, 9, 5, 1, 1, 0, 2, 9, 8, 8, 8, 8, 8, 2, 2, 5, 8, 3, 0, 5,	
		9, 5, 8, 7, 0, 6, 6, 2, 3, 5,	9, 5, 8, 7, 0, 6, 6, 2, 3, 5,	
		9, 0, 1, 9, 7, 1, 4, 5, 1, 5,	9, 0, 1, 9, 7, 1, 4, 5, 1, 5,	
		5, 3, 7, 2, 6, 4, 1, 3, 2, 4,	5, 3, 7, 2, 6, 4, 1, 3, 2, 4,	
		6, 5, 2, 4, 1, 1, 3, 5, 6, 2, 0, 0, 5, 4, 7, 8, 4, 3, 1, 7,	6, 5, 2, 4, 1, 1, 3, 5, 6, 2, 0, 0, 5, 4, 7, 8, 4, 3, 1, 7,	
		1, 9, 3, 8, 0, 7, 8, 0, 3, 6,	1, 9, 3, 8, 0, 7, 8, 0, 3, 6,	
		3, 8, 0, 3, 1, 7, 2, 1, 7, 9]	3, 8, 0, 3, 1, 7, 2, 1, 7, 9]	
		[8, 7, 13, 14, 16, 12, 9, 14, 6, 7, 7, 14, 9, 7, 14, 9, 11,	[8, 7, 13, 14, 16, 12, 9, 14, 6, 7, 7, 14, 9, 7, 14, 9, 11,	
		9, 14, 10, 11, 10, 7, 13, 14,	9, 14, 10, 11, 10, 7, 13, 14,	
		10, 2, 9, 12, 9, 9, 7, 12, 12,	10, 2, 9, 12, 9, 9, 7, 12, 12,	
		11, 6, 15, 9, 13, 14, 15, 11, 12, 5, 7, 8, 9, 7, 1, 10, 13,	11, 6, 15, 9, 13, 14, 15, 11, 12, 5, 7, 8, 9, 7, 1, 10, 13,	
		9, 14, 14, 14, 3, 14, 6, 14,	9, 14, 14, 14, 3, 14, 6, 14,	
		15, 15, 8, 11, 2, 11, 7, 9, 5,	15, 15, 8, 11, 2, 11, 7, 9, 5,	
		1, 9, 9, 11, 9, 6, 15, 6, 14,	1, 9, 9, 11, 9, 6, 15, 6, 14,	
		10, 8, 5, 12, 9, 9, 10, 13, 3, 17, 3, 9, 13, 4, 3, 4, 11, 5,	10, 8, 5, 12, 9, 9, 10, 13, 3, 17, 3, 9, 13, 4, 3, 4, 11, 5,	
		14, 5, 14, 10, 1, 10, 13, 8,	14, 5, 14, 10, 1, 10, 13, 8,	
		8, 16, 0, 9, 6, 9, 15, 7, 2,	8, 16, 0, 9, 6, 9, 15, 7, 2,	
		11, 13, 12, 17, 14, 6, 16, 4, 12, 13, 1, 13, 10, 4, 11, 9,	11, 13, 12, 17, 14, 6, 16, 4, 12, 13, 1, 13, 10, 4, 11, 9,	
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Test	Expected	Got
	3, 10, 11, 15, 9, 6, 12, 5,	3, 10, 11, 15, 9, 6, 12, 5,
	10, 4, 8, 4, 13, 10, 3, 7, 7,	10, 4, 8, 4, 13, 10, 3, 7, 7,
	11, 15, 9, 11, 3, 6, 17, 7,	11, 15, 9, 11, 3, 6, 17, 7,
	10, 17, 7, 10, 5, 8, 11, 11,	10, 17, 7, 10, 5, 8, 11, 11,
	15, 14, 2, 8, 9, 3, 12, 15,	15, 14, 2, 8, 9, 3, 12, 15,
	10, 14, 10, 10, 3, 5, 9, 11,	10, 14, 10, 10, 3, 5, 9, 11,
	9, 2, 12, 18, 10, 12, 14, 0,	9, 2, 12, 18, 10, 12, 14, 0,
	14, 8, 9, 10, 8, 9, 7, 3, 11,	14, 8, 9, 10, 8, 9, 7, 3, 11,
	10, 10, 6, 10, 5, 14, 5, 6,	10, 10, 6, 10, 5, 14, 5, 6,
	15, 2, 8, 12, 3, 8, 4, 4, 12,	15, 2, 8, 12, 3, 8, 4, 4, 12,
	11, 3, 9, 1, 5, 11, 9, 9, 3,	11, 3, 9, 1, 5, 11, 9, 9, 3,
	1, 8, 5, 11, 16, 8, 9, 5, 6,	1, 8, 5, 11, 16, 8, 9, 5, 6,
	15, 6, 10, 11, 12, 7, 15, 16,	15, 6, 10, 11, 12, 7, 15, 16,
	6, 8, 11, 6, 11, 2, 11, 4, 8,	6, 8, 11, 6, 11, 2, 11, 4, 8,
	6, 10, 15, 14]	6, 10, 15, 14]



Test	Expected	Got	
int arr[] = {0, 5, 7, 0, 9, 2, 8, 3, 2, 2, 9, 3,	(, [0, 5, 7, 0, 9, 2, 8, 3, 2, 2,	[0, 5, 7, 0, 9, 2, 8, 3, 2, 2,	~
2, 8, 0, 1, 4, 7, 3, 4, 0, 4, 5, 2, 0, 3, 1, 5, 3	9, 3, 7, 2, 8, 0, 1, 4, 7, 3,	9, 3, 7, 2, 8, 0, 1, 4, 7, 3,	
0, 2, 8, 7, 7, 1, 5, 3, 7, 9, 6, 4, 9, 8, 5, 5, 4		4, 0, 4, 5, 2, 0, 3, 1, 5, 3,	
3, 6, 9, 8, 0, 4, 5, 9, 4, 1, 5, 4, 2, 6, 4, 2, 1		0, 2, 8, 7, 7, 1, 5, 3, 7, 9,	
3, 1, 4, 6, 9, 0, 9, 6, 9, 9, 2, 0, 8, 9, 4, 9, 7		6, 4, 9, 8, 5, 5, 4, 3, 6, 9,	
0, 0, 5, 1, 2, 5, 2, 7, 5, 3, 3, 9, 8, 6, 5, 7, 9		8, 0, 4, 5, 9, 4, 1, 5, 4, 2,	
7, 3, 3, 0, 5, 9, 1, 2, 0, 2, 8, 5, 6, 3, 2, 7, 8 6, 1, 5, 7, 1, 4, 9, 3, 2, 6, 1, 7, 9, 9, 4, 0, 9		6, 4, 2, 1, 3, 1, 4, 6, 9, 0, 9, 6, 9, 9, 2, 0, 8, 9, 4, 9,	
9, 2, 1, 1, 4, 3, 8, 7, 0, 8, 5, 0, 2, 8, 9, 6, 6		7, 0, 0, 5, 1, 2, 5, 2, 7, 5,	
8, 0, 6, 4, 2, 5, 1, 7, 2, 1, 3, 1, 6, 9, 0, 3, 9		3, 3, 9, 8, 6, 5, 7, 9, 7, 3,	
6, 2, 8, 7, 8, 1, 8, 6, 8, 0, 5, 4, 8, 0, 0, 6, 7		3, 0, 5, 9, 1, 2, 0, 2, 8, 5,	
4, 3, 5, 6, 3, 2, 2, 8, 2, 6, 3, 7, 9, 7, 2, 0, 3	6, 3, 2, 7, 8, 6, 1, 5, 7, 1,	6, 3, 2, 7, 8, 6, 1, 5, 7, 1,	
7, 6, 7, 6, 3, 3, 0, 4, 3, 2, 4, 3, 1, 4, 1, 5, 0	4, 9, 3, 2, 6, 1, 7, 9, 9, 4,	4, 9, 3, 2, 6, 1, 7, 9, 9, 4,	
3, 7, 4, 4, 0, 3, 9, 0, 4, 1, 7, 6, 6, 3, 7, 0, 4	0, 9, 9, 2, 1, 1, 4, 3, 8, 7,	0, 9, 9, 2, 1, 1, 4, 3, 8, 7,	
3, 6, 9, 2, 6, 7, 8, 4, 7, 5, 8, 0, 3, 4, 0, 1, 9		0, 8, 5, 0, 2, 8, 9, 6, 6, 8,	
2, 9, 8, 8, 3, 9, 9, 6, 2, 0, 1, 4, 2, 1, 4, 9, 4		0, 6, 4, 2, 5, 1, 7, 2, 1, 3,	
3, 7, 9, 7, 0, 0, 2, 7, 7, 4, 5, 2, 9, 9, 2, 1, 5		1, 6, 9, 0, 3, 9, 6, 2, 8, 7,	
4, 0, 9, 1, 0, 9, 3, 9, 5, 2, 6, 8, 4, 0, 0, 1, 0		8, 1, 8, 6, 8, 0, 5, 4, 8, 0,	
0, 5, 9, 1, 2, 8, 4, 7, 2, 3, 2, 7, 5, 4, 8, 2, 0 7, 8, 6, 0, 1, 5, 5, 1, 4, 2, 4, 1, 4, 1, 4, 5, 0		0, 6, 7, 4, 3, 5, 6, 3, 2, 2, 8, 2, 6, 3, 7, 9, 7, 2, 0, 3,	
7, 7, 6, 4, 7, 3, 9, 3, 9, 5, 7, 2, 6, 2, 9, 7, 9		7, 6, 7, 6, 3, 3, 0, 4, 3, 2,	
0, 3, 1, 0, 2, 9, 7, 5, 1, 3, 1, 5, 5, 9, 2, 3, 8		4, 3, 1, 4, 1, 5, 0, 3, 7, 4,	
5, 5, 6, 0, 9, 1, 0, 0, 5, 2, 5, 6, 0, 7, 6, 3, 4		4, 0, 3, 9, 0, 4, 1, 7, 6, 6,	
9, 4, 5, 9, 0, 3, 0, 2, 8, 7, 6, 4, 0, 9, 9, 6, 8		3, 7, 0, 4, 3, 6, 9, 2, 6, 7,	
1, 1, 3, 0, 7, 7, 4, 8, 1, 6, 4, 2, 4, 6, 4, 7, 7	VIIAC.W.	8, 4, 7, 5, 8, 0, 3, 4, 0, 1,	
2, 5, 8, 6, 8, 5, 3, 6, 1, 8, 5, 2, 8, 6, 8, 6, 0	9, 2, 9, 8, 8, 3, 9, 9, 6, 2,	9, 2, 9, 8, 8, 3, 9, 9, 6, 2,	
2, 5, 0, 4, 1, 8, 4, 2, 2, 3, 1, 0, 4, 8, 5, 3, 2	0, 1, 4, 2, 1, 4, 9, 4, 3, 7,	0, 1, 4, 2, 1, 4, 9, 4, 3, 7,	
7, 1, 7, 1, 8, 7, 8, 0, 9, 6, 1, 9, 1, 6, 7, 5, 3	9, 7, 0, 0, 2, 7, 7, 4, 5, 2,	9, 7, 0, 0, 2, 7, 7, 4, 5, 2,	
8, 3, 1, 9, 8, 0, 4, 3, 4, 0, 5, 7, 3, 0, 8, 1, 0		9, 9, 2, 1, 5, 4, 0, 9, 1, 0,	
7, 3, 4, 0, 8, 5, 0, 8, 7, 4, 7, 3, 5, 3, 2, 5, 2		9, 3, 9, 5, 2, 6, 8, 4, 0, 0,	
5, 2, 0, 1, 9, 0, 1, 7, 6, 2, 3, 1, 9, 5, 7, 2, 8		1, 0, 0, 5, 9, 1, 2, 8, 4, 7,	
2, 2, 9, 1, 1, 0, 1, 2, 2, 9, 2, 3, 0, 6, 8, 0, 3, 8, 0, 4, 2, 5, 4, 7, 6, 8, 0, 2, 4, 9, 2, 1, 9, 3		2, 3, 2, 7, 5, 4, 8, 2, 0, 7, 8, 6, 0, 1, 5, 5, 1, 4, 2, 4,	
6, 0, 3, 1, 5, 6, 2, 5, 4, 3, 8, 6, 9, 4, 1, 6, 8		1, 4, 1, 4, 5, 0, 7, 7, 6, 4,	
6, 0, 4, 3, 4, 4, 7, 5, 8, 8, 4, 9, 9, 4, 3, 9, 9		7, 3, 9, 3, 9, 5, 7, 2, 6, 2,	
1, 1, 5, 9, 2, 3, 0, 8, 9, 1, 1, 8, 3, 0, 1, 2, 9		9, 7, 9, 0, 3, 1, 0, 2, 9, 7,	
5, 0, 8, 0, 8, 8, 1, 2, 8, 5, 9, 5, 4, 8, 0, 3, 9		5, 1, 3, 1, 5, 5, 9, 2, 3, 8,	
1, 4, 1, 5, 9, 5, 1, 9, 1, 5, 3, 0, 0, 5, 6, 2, 9	5, 5, 6, 0, 9, 1, 0, 0, 5, 2,	5, 5, 6, 0, 9, 1, 0, 0, 5, 2,	
7, 7, 7, 3, 5, 1, 7, 4, 6, 2, 4, 4, 4, 3, 3, 9, 0	5, 6, 0, 7, 6, 3, 4, 9, 4, 5,	5, 6, 0, 7, 6, 3, 4, 9, 4, 5,	
7, 1, 3, 5, 3, 6, 6, 0, 8, 8, 5, 2, 1, 4, 1, 6, 4	9, 0, 3, 0, 2, 8, 7, 6, 4, 0,	9, 0, 3, 0, 2, 8, 7, 6, 4, 0,	
7, 9, 9, 1, 7, 8, 0, 8, 5, 3, 1, 3, 6, 2, 4, 8, 0		9, 9, 6, 8, 1, 1, 3, 0, 7, 7,	
0, 5, 0, 6, 6, 2, 5, 0, 4, 5, 0, 5, 3, 8, 1, 3, 1		4, 8, 1, 6, 4, 2, 4, 6, 4, 7,	
7, 7, 9, 1, 6, 6, 8, 3, 5, 9, 4, 5, 9, 0, 6, 0, 4, 0, 2, 9, 1, 6, 5, 8, 3, 5, 0, 0, 6, 5, 5, 8, 6, 0		7, 2, 5, 8, 6, 8, 5, 3, 6, 1, 8, 5, 2, 8, 6, 8, 6, 0, 2, 5,	
2, 7, 5, 7, 9, 0, 4, 3, 9, 4, 1, 2, 0, 2, 7, 0, 3		0, 4, 1, 8, 4, 2, 2, 3, 1, 0,	
7, 9, 6, 5, 9, 4, 6, 0, 5, 5, 5, 0, 8, 3, 6, 8, 0		4, 8, 5, 3, 2, 7, 1, 7, 1, 8,	
6, 7, 1, 5, 4, 7, 7, 5, 7, 6, 8, 8, 4, 2, 7, 2, 5		7, 8, 0, 9, 6, 1, 9, 1, 6, 7,	
9, 0, 3, 1, 5, 6, 5, 2, 7, 8, 1, 9, 0, 0, 3, 2, 2		5, 3, 8, 3, 1, 9, 8, 0, 4, 3,	
5, 3, 4, 5, 0, 1, 0, 0, 5, 0, 2, 5, 1, 8, 9, 0, 0		4, 0, 5, 7, 3, 0, 8, 1, 0, 7,	
8, 0, 6, 3, 7, 0, 7, 3, 2, 7, 7, 4, 9, 8, 8, 5, 6	3, 4, 0, 8, 5, 0, 8, 7, 4, 7,	3, 4, 0, 8, 5, 0, 8, 7, 4, 7,	
1, 7, 5, 2, 7, 9, 0, 7, 2, 4, 5, 7, 8, 6, 5, 9, 5	3, 5, 3, 2, 5, 2, 5, 2, 0, 1,	3, 5, 3, 2, 5, 2, 5, 2, 0, 1,	
3, 9, 6, 7, 6, 9, 3, 7, 9, 0, 8, 7, 3, 5, 2, 9, 3		9, 0, 1, 7, 6, 2, 3, 1, 9, 5,	
1, 8, 3, 6, 3, 5, 3, 9, 7, 3, 3, 7, 7, 1, 4, 2, 9		7, 2, 8, 2, 2, 9, 1, 1, 0, 1,	
7, 4, 3, 8, 2, 0, 8, 8, 2, 1, 3, 5, 9, 5, 5, 8, 2		2, 2, 9, 2, 3, 0, 6, 8, 0, 3,	
7, 3, 4, 9, 8, 9, 7, 2, 5, 8, 4, 4, 6, 0, 7, 6, 4		8, 0, 4, 2, 5, 4, 7, 6, 8, 0,	
7, 0, 8, 4, 1, 6, 6, 7, 8, 1, 6, 9, 5, 1, 6, 6, 8		2, 4, 9, 2, 1, 9, 3, 6, 0, 3,	
6, 6, 6, 5, 1, 0, 3, 3, 8, 4, 5, 8, 9, 5, 6, 5, 4, 0, 6, 7, 2, 6, 1, 6, 4, 6, 9, 6, 2, 0, 8, 2, 3, 7,		1, 5, 6, 2, 5, 4, 3, 8, 6, 9, 4, 1, 6, 8, 6, 0, 4, 3, 4, 4,	
0, 7, 4, 1, 0, 3, 7, 9, 5, 9, 1, 5, 5, 7, 6, 2, 4		7, 5, 8, 8, 4, 9, 9, 4, 3, 9,	
6, 8, 0, 7, 9, 6};	9, 1, 1, 5, 9, 2, 3, 0, 8, 9,	9, 1, 1, 5, 9, 2, 3, 0, 8, 9,	
LLNode* head = LLNode::createWithIterators(arr, a		1, 1, 8, 3, 0, 1, 2, 9, 5, 0,	
+ sizeof(arr) / sizeof(int));	8, 0, 8, 8, 1, 2, 8, 5, 9, 5,	8, 0, 8, 8, 1, 2, 8, 5, 9, 5,	
, ,	8, 0, 8, 8, 1, 2, 8, 5, 9, 5, 4, 8, 0, 3, 9, 1, 4, 1, 5, 9,	8, 0, 8, 8, 1, 2, 8, 5, 9, 5, 4, 8, 0, 3, 9, 1, 4, 1, 5, 9,	
+ sizeof(arr) / sizeof(int));			

Test	Expected	Got
LLNode* newhead = foldLinkedList(head);	6, 2, 4, 4, 4, 3, 3, 9, 0, 7,	6, 2, 4, 4, 4, 3, 3, 9, 0, 7,
<pre>LLNode::printList(newhead);</pre>	1, 3, 5, 3, 6, 6, 0, 8, 8, 5,	1, 3, 5, 3, 6, 6, 0, 8, 8, 5,
	2, 1, 4, 1, 6, 4, 7, 9, 9, 1,	2, 1, 4, 1, 6, 4, 7, 9, 9, 1,
	7, 8, 0, 8, 5, 3, 1, 3, 6, 2,	7, 8, 0, 8, 5, 3, 1, 3, 6, 2,
	4, 8, 0, 0, 5, 0, 6, 6, 2, 5,	4, 8, 0, 0, 5, 0, 6, 6, 2, 5,
	0, 4, 5, 0, 5, 3, 8, 1, 3, 1,	0, 4, 5, 0, 5, 3, 8, 1, 3, 1,
	7, 7, 9, 1, 6, 6, 8, 3, 5, 9, 4, 5, 9, 0, 6, 0, 4, 0, 2, 9,	7, 7, 9, 1, 6, 6, 8, 3, 5, 9,
	1, 6, 5, 8, 3, 5, 0, 0, 6, 5,	4, 5, 9, 0, 6, 0, 4, 0, 2, 9, 1, 6, 5, 8, 3, 5, 0, 0, 6, 5,
	5, 8, 6, 0, 2, 7, 5, 7, 9, 0,	5, 8, 6, 0, 2, 7, 5, 7, 9, 0,
	4, 3, 9, 4, 1, 2, 0, 2, 7, 0,	4, 3, 9, 4, 1, 2, 0, 2, 7, 0,
	3, 7, 9, 6, 5, 9, 4, 6, 0, 5,	3, 7, 9, 6, 5, 9, 4, 6, 0, 5,
	5, 5, 0, 8, 3, 6, 8, 0, 6, 7,	5, 5, 0, 8, 3, 6, 8, 0, 6, 7,
	1, 5, 4, 7, 7, 5, 7, 6, 8, 8,	1, 5, 4, 7, 7, 5, 7, 6, 8, 8,
	4, 2, 7, 2, 5, 9, 0, 3, 1, 5,	4, 2, 7, 2, 5, 9, 0, 3, 1, 5,
	6, 5, 2, 7, 8, 1, 9, 0, 0, 3,	6, 5, 2, 7, 8, 1, 9, 0, 0, 3,
	2, 2, 5, 3, 4, 5, 0, 1, 0, 0, 5, 0, 2, 5, 1, 8, 9, 0, 0, 8,	2, 2, 5, 3, 4, 5, 0, 1, 0, 0, 5, 0, 2, 5, 1, 8, 9, 0, 0, 8,
	0, 6, 3, 7, 0, 7, 3, 2, 7, 7,	0, 6, 3, 7, 0, 7, 3, 2, 7, 7,
	4, 9, 8, 8, 5, 6, 1, 7, 5, 2,	4, 9, 8, 8, 5, 6, 1, 7, 5, 2,
	7, 9, 0, 7, 2, 4, 5, 7, 8, 6,	7, 9, 0, 7, 2, 4, 5, 7, 8, 6,
	5, 9, 5, 3, 9, 6, 7, 6, 9, 3,	5, 9, 5, 3, 9, 6, 7, 6, 9, 3,
	7, 9, 0, 8, 7, 3, 5, 2, 9, 3,	7, 9, 0, 8, 7, 3, 5, 2, 9, 3,
	1, 8, 3, 6, 3, 5, 3, 9, 7, 3,	1, 8, 3, 6, 3, 5, 3, 9, 7, 3,
	3, 7, 7, 1, 4, 2, 9, 7, 4, 3,	3, 7, 7, 1, 4, 2, 9, 7, 4, 3,
→	8, 2, 0, 8, 8, 2, 1, 3, 5, 9, 5, 5, 8, 2, 7, 3, 4, 9, 8, 9,	8, 2, 0, 8, 8, 2, 1, 3, 5, 9, 5, 5, 8, 2, 7, 3, 4, 9, 8, 9,
C)	7, 2, 5, 8, 4, 4, 6, 0, 7, 6,	7, 2, 5, 8, 4, 4, 6, 0, 7, 6,
W CH	4, 7, 0, 8, 4, 1, 6, 6, 7, 8,	4, 7, 0, 8, 4, 1, 6, 6, 7, 8,
က	1, 6, 9, 5, 1, 6, 6, 8, 6, 6,	1, 6, 9, 5, 1, 6, 6, 8, 6, 6,
	6, 5, 1, 0, 3, 3, 8, 4, 5, 8,	6, 5, 1, 0, 3, 3, 8, 4, 5, 8,
	9, 5, 6, 5, 4, 0, 6, 7, 2, 6,	9, 5, 6, 5, 4, 0, 6, 7, 2, 6,
	1, 6, 4, 6, 9, 6, 2, 0, 8, 2,	1, 6, 4, 6, 9, 6, 2, 0, 8, 2,
	3, 7, 0, 7, 4, 1, 0, 3, 7, 9, 5, 9, 1, 5, 5, 7, 6, 2, 4, 6,	3, 7, 0, 7, 4, 1, 0, 3, 7, 9, 5, 9, 1, 5, 5, 7, 6, 2, 4, 6,
	8, 0, 7, 9, 6]	8, 0, 7, 9, 6]
TÀII	[3, 7, 8, 9, 9, 9, 8, 1, 14,	[3, 7, 8, 9, 9, 9, 8, 1, 14,
	$0 \mid 0, 1, 11, 9, 9, 3, 2, 1/2, 5,$	8, 1, 11, 9, 9, 3, 2, 17, 5,
	B O I H 10 M 9, 13, 2, 6, 12, 5, 1, 8,	10, 9, 13, 2, 6, 12, 5, 1, 8,
	10, 3, 5, 17, 5, 8, 7, 12, 9,	10, 3, 5, 17, 5, 8, 7, 12, 9,
	9, 4, 14, 9, 4, 10, 12, 12, 8,	9, 4, 14, 9, 4, 10, 12, 12, 8,
	13, 9, 7, 4, 7, 14, 10, 5, 9,	13, 9, 7, 4, 7, 14, 10, 5, 9,
	4, 9, 2, 5, 5, 13, 7, 6, 5, 9, 5, 8, 12, 17, 10, 9, 8, 13,	4, 9, 2, 5, 5, 13, 7, 6, 5, 9, 5, 8, 12, 17, 10, 9, 8, 13,
	14, 1, 10, 6, 9, 12, 13, 13,	14, 1, 10, 6, 9, 12, 13, 13,
	13, 10, 11, 16, 13, 10, 7, 11,	
	13, 7, 2, 13, 13, 9, 10, 0,	13, 7, 2, 13, 13, 9, 10, 0,
	11, 10, 2, 9, 14, 12, 9, 1, 6,	11, 10, 2, 9, 14, 12, 9, 1, 6,
	15, 12, 8, 10, 0, 11, 8, 10,	15, 12, 8, 10, 0, 11, 8, 10,
	7, 12, 14, 13, 8, 10, 15, 0,	7, 12, 14, 13, 8, 10, 15, 0,
	9, 14, 3, 9, 1, 5, 10, 14, 1,	9, 14, 3, 9, 1, 5, 10, 14, 1,
	15, 6, 10, 11, 3, 2, 14, 11, 7, 10, 10, 8, 12, 10, 14, 3,	15, 6, 10, 11, 3, 2, 14, 11, 7, 10, 10, 8, 12, 10, 14, 3,
	7, 5, 9, 2, 13, 11, 13, 5, 9,	7, 5, 9, 2, 13, 11, 13, 5, 9,
	11, 7, 12, 10, 6, 14, 6, 13,	11, 7, 12, 10, 6, 14, 6, 13,
	10, 6, 15, 15, 5, 7, 5, 5, 5,	10, 6, 15, 15, 5, 7, 5, 5, 5,
	7, 8, 9, 13, 10, 6, 12, 9, 0,	7, 8, 9, 13, 10, 6, 12, 9, 0,
	14, 13, 10, 1, 5, 14, 6, 9,	14, 13, 10, 1, 5, 14, 6, 9,
	15, 2, 3, 7, 7, 10, 14, 4, 6,	15, 2, 3, 7, 7, 10, 14, 4, 6,
	9, 9, 5, 0, 6, 3, 8, 5, 11, 7,	9, 9, 5, 0, 6, 3, 8, 5, 11, 7,
	9, 12, 18, 4, 15, 6, 9, 12, 5,	9, 12, 18, 4, 15, 6, 9, 12, 5,
	13, 9, 6, 11, 9, 15, 2, 9, 4,	13, 9, 6, 11, 9, 15, 2, 9, 4,
	9, 16, 3, 6, 5, 15, 12, 12, 3, 4, 15, 9, 6, 10, 10, 1, 2, 9,	9, 16, 3, 6, 5, 15, 12, 12, 3, 4, 15, 9, 6, 10, 10, 1, 2, 9,
	11, 16, 18, 3, 12, 11, 18, 6,	11, 16, 18, 3, 12, 11, 18, 6,
		, , , , , , , , , , , , , , , , , , ,

Test	Expected	Got
	10, 3, 0, 6, 10, 0, 11, 12,	10, 3, 0, 6, 10, 0, 11, 12,
	16, 10, 13, 16, 10, 8, 9, 11,	16, 10, 13, 16, 10, 8, 9, 11,
	8, 9, 0, 15, 6, 12, 14, 7, 7,	8, 9, 0, 15, 6, 12, 14, 7, 7,
	11, 1, 14, 7, 7, 11, 9, 14, 9,	11, 1, 14, 7, 7, 11, 9, 14, 9,
	8, 13, 5, 6, 8, 5, 9, 11, 3,	8, 13, 5, 6, 8, 5, 9, 11, 3,
	7, 1, 8, 9, 11, 9, 13, 15, 4,	7, 1, 8, 9, 11, 9, 13, 15, 4,
	9, 2, 7, 12, 9, 5, 11, 5, 12,	9, 2, 7, 12, 9, 5, 11, 5, 12,
	7, 2, 4, 6, 5, 8, 4, 9, 11, 1,	7, 2, 4, 6, 5, 8, 4, 9, 11, 1,
	8, 17, 4, 5, 8, 8, 12, 11, 8,	8, 17, 4, 5, 8, 8, 12, 11, 8,
	8, 14, 11, 4, 13, 16, 7, 9,	8, 14, 11, 4, 13, 16, 7, 9,
	17, 14, 6, 9, 2, 9, 12, 3, 12,	17, 14, 6, 9, 2, 9, 12, 3, 12,
	11, 4, 13, 2, 12, 11, 13, 17,	11, 4, 13, 2, 12, 11, 13, 17,
	14, 7, 9, 10, 11, 9, 13, 15,	14, 7, 9, 10, 11, 9, 13, 15,
	9, 13, 4, 8, 11, 9, 17, 7, 7,	9, 13, 4, 8, 11, 9, 17, 7, 7,
	14, 11, 16, 4, 7, 10, 6, 15,	14, 11, 16, 4, 7, 10, 6, 15,
	7, 6, 10, 14, 8, 9, 11, 14, 9,	7, 6, 10, 14, 8, 9, 11, 14, 9,
	4, 10, 7, 17, 9, 4, 5, 9, 11,	4, 10, 7, 17, 9, 4, 5, 9, 11,
	5, 8, 11, 5, 8, 12, 12, 14,	5, 8, 11, 5, 8, 12, 12, 14,
	11, 13, 17, 5, 10, 8, 11, 11,	11, 13, 17, 5, 10, 8, 11, 11,
	13, 11, 8, 7, 5, 8, 11, 13,	13, 11, 8, 7, 5, 8, 11, 13,
	10, 9, 15, 6, 6, 16, 9, 14,	10, 9, 15, 6, 6, 16, 9, 14,
	13, 1, 15, 12, 11, 9, 4, 7,	13, 1, 15, 12, 11, 9, 4, 7,
	11, 9, 7, 8, 10, 13, 7, 10,	11, 9, 7, 8, 10, 13, 7, 10,
	15, 10, 5, 0, 11, 12, 14, 7,	15, 10, 5, 0, 11, 12, 14, 7,
	9, 13, 14, 13, 15, 9, 10, 9,	9, 13, 14, 13, 15, 9, 10, 9,
	13, 10, 7, 7, 8, 13, 12, 8, 9,	13, 10, 7, 7, 8, 13, 12, 8, 9,
	9, 7, 1, 11, 2, 5, 12, 4, 7,	9, 7, 1, 11, 2, 5, 12, 4, 7,
	8, 4, 7, 7, 8, 9, 13, 11, 8,	8, 4, 7, 7, 8, 9, 13, 11, 8,
	8, 14, 9, 8, 5, 12, 8, 17, 0,	8, 14, 9, 8, 5, 12, 8, 17, 0,
	14, 14, 6]	14, 14, 6]



	Test	Expected	Got	
~	int arr[] = {7, 0, 3, 1, 1, 2, 7, 0, 6, 5, 9, 8, 7,	[7, 0, 3, 1, 1, 2, 7, 0, 6, 5,	[7, 0, 3, 1, 1, 2, 7, 0, 6, 5,	~
	4, 7, 6, 4, 1, 7, 5, 0, 8, 7, 9, 1, 5, 5, 1, 4, 6,	9, 8, 7, 4, 7, 6, 4, 1, 7, 5,	9, 8, 7, 4, 7, 6, 4, 1, 7, 5,	
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		KHOACNCP.COM		

Test	Expected	Got
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1, 3, 4, 9, 0, 0, 2, 2, 4, 0, 1, 8, 3, 4, 1, 9, 0,	8, 6, 8, 4, 8, 8, 6, 6, 2, 1,	8, 6, 8, 4, 8, 8, 6, 6, 2, 1,
9, 4, 1, 7, 4, 1, 8, 7, 4, 7, 1, 2, 7, 9, 2, 4, 3,	7, 7, 4, 4, 9, 8, 9, 4, 9, 5,	7, 7, 4, 4, 9, 8, 9, 4, 9, 5,
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Test	Expected	Got
0, 2, 3, 5, 5, 1, 6, 9, 1, 7, 4, 9, 0, 4, 8, 1, 6,	5, 0, 8, 7, 9, 7, 5, 6, 9, 2,	5, 0, 8, 7, 9, 7, 5, 6, 9, 2,
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2, 6, 9, 5, 6, 5, 7, 0, 4, 1, 4, 4, 7, 2, 0, 8, 0,	5,snip, 6, 6, 11, 13,	5,snip, 6, 6, 11, 13,
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7, 1, 0, 6, 2, 1, 4, 8, 1, 5, 9, 5, 2, 2, 3, 7, 5,	6, 3, 7, 12, 2, 15, 6, 13, 5,	6, 3, 7, 12, 2, 15, 6, 13, 5,
7, 3, 5, 5, 3, 9, 0, 3, 5, 3, 9, 6, 8, 9, 7, 1, 8,	8, 9, 10, 4, 10, 8, 14, 4, 3,	8, 9, 10, 4, 10, 8, 14, 4, 3,
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3, 6, 2, 2, 0, 0, 4, 2, 1, 9, 5, 4, 6, 3, 3, 4, 7,	8, 9, 9, 12, 9, 12, 12, 15,	8, 9, 9, 12, 9, 12, 12, 15,
7, 8, 3, 8, 5, 5, 2, 8, 0, 1, 5, 2, 0, 3, 9, 4, 0,	10, 11, 7, 10, 17, 11, 6, 13,	10, 11, 7, 10, 17, 11, 6, 13,
1, 1, 7, 0, 9, 5, 5, 8, 9, 8, 4, 8, 3, 3, 8, 1, 4,	4, 11, 14, 6, 14, 10, 15, 6,	4, 11, 14, 6, 14, 10, 15, 6,
0, 3, 7, 8, 5, 1, 2, 5, 2, 0, 1, 3, 9, 6, 3, 2, 7,	2, 14, 6, 3, 16, 14, 9, 5, 15,	2, 14, 6, 3, 16, 14, 9, 5, 15,
9, 8, 9, 5, 0, 8, 9, 2, 8, 5, 9, 8, 5, 6, 6, 8, 7, 4, 1, 9, 4, 7, 7, 5, 2, 6, 8, 5, 3, 0, 2, 7, 5, 7,	6, 6, 10, 10, 13, 6, 11, 12, 16, 12, 11, 10, 1, 8, 12, 7,	6, 6, 10, 10, 13, 6, 11, 12, 16, 12, 11, 10, 1, 8, 12, 7,
0, 6, 2, 8, 7, 9, 0, 1, 0, 8, 0, 8, 3, 1, 6, 0, 1,	7, 15, 7, 8, 10, 16, 12, 9, 4,	7, 15, 7, 8, 10, 16, 12, 9, 4,
8, 5};	9, 16, 14, 9, 7, 10, 4, 1, 9,	9, 16, 14, 9, 7, 10, 4, 1, 9,
LLNode* head = LLNode::createWithIterators(arr, arr	10, 12, 5, 0, 11, 7, 8, 3, 6,	10, 12, 5, 0, 11, 7, 8, 3, 6,
+ sizeof(arr) / sizeof(int));	15, 11, 11, 9, 3, 17, 11, 3,	15, 11, 11, 9, 3, 17, 11, 3,
LLNode::printList(head);	12, 11, 14, 9, 13, 6, 8, 16,	12, 11, 14, 9, 13, 6, 8, 16,
cout << "\n";	6, 13, 6, 12, 6, 9, 9, 6, 1,	6, 13, 6, 12, 6, 9, 9, 6, 1,
LLNode* newhead = foldLinkedList(head);	2, 2, 12, 18, 3, 4, 0, 6, 8,	2, 2, 12, 18, 3, 4, 0, 6, 8,
LLNode::printList(newhead);	10, 8, 10, 10, 5, 4, 1, 12,	10, 8, 10, 10, 5, 4, 1, 12,
	11, 11, 17, 7, 2, 8, 8, 8, 10,	11, 11, 17, 7, 2, 8, 8, 8, 10,
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	12, 13, 6, 9, 2, 11, 5, 9, 10,	12, 13, 6, 9, 2, 11, 5, 9, 10,
	8, 15, 9, 10, 9, 7, 16, 12, 6,	8, 15, 9, 10, 9, 7, 16, 12, 6,
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	8, 5, 4, 6, 0, 10, 5, 9, 11,	8, 5, 4, 6, 0, 10, 5, 9, 11,
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Test	Expected	Got
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	9, 14, 10, 8, 1, 10, 1, 4, 0,	9, 14, 10, 8, 1, 10, 1, 4, 0,
	9, 9, 8, 13, 7, 12, 7, 10, 7,	9, 9, 8, 13, 7, 12, 7, 10, 7,
	6, 9, 13, 10, 5, 15, 11, 6, 6, 5, 12, 1, 5, 4, 18, 8, 2, 8,	6, 9, 13, 10, 5, 15, 11, 6, 6, 5, 12, 1, 5, 4, 18, 8, 2, 8,
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	13, 6, 7, 0, 5, 6, 11, 9, 8,	13, 6, 7, 0, 5, 6, 11, 9, 8,
	4, 9, 8, 12, 11, 9, 7, 12, 15,	4, 9, 8, 12, 11, 9, 7, 12, 15,
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1KI.	9, 7, 11, 3, 5, 5, 8, 14, 5,	9, 7, 11, 3, 5, 5, 8, 14, 5,
C.XX	8, 15, 16, 5, 15, 16, 6, 12,	8, 15, 16, 5, 15, 16, 6, 12,
OF CHKHO	0, 2, 17, 7, 11, 9, 3, 9, 7,	0, 2, 17, 7, 11, 9, 3, 9, 7,
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TÀI LIÊ	15, 6, 3, 10, 0, 12, 4, 2, 13, 10, 0, 11, 9, 14, 7, 5, 9, 7,	15, 6, 3, 10, 0, 12, 4, 2, 13, 10, 0, 11, 9, 14, 7, 5, 9, 7,
IAILIĖ	2, 5, 10, 2, 2, 8, 11, 8, 7,	2, 5, 10, 2, 2, 8, 11, 8, 7,
P Å I H	6, 10, 16, 13, 9, 7, 9, 16, 9,	6, 10, 16, 13, 9, 7, 9, 16, 9,
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	0, 16, 10, 4, 5, 12, 8, 8, 11,	0, 16, 10, 4, 5, 12, 8, 8, 11,
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	8, 10, 13, 3, 0, 8, 7, 8, 0,	8, 10, 13, 3, 0, 8, 7, 8, 0,
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Test	Expected Got
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Test	Expected	Got	
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Test	Expected	Got
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8, 8, 6, 6, 6, 3, 7, 6, 6, 8, 0, 8, 4, 7, 7, 2, 4,	8, 1, 4, 0, 5, 0, 7, 3, 6, 1, 3, 9, 0, 1, 7, 2, 8, 5, 2, 1,	3, 9, 0, 1, 7, 2, 8, 5, 2, 1,
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6, 6, 3, 3, 0, 5, 4, 9, 9, 2, 5, 3, 5, 7, 5, 3, 3,	7, 0, 2, 3, 8, 8, 9, 5, 2, 3,	7, 0, 2, 3, 8, 8, 9, 5, 2, 3,
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	Test	Expected	Got	
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	<pre>6, 3}; LLNode* head = LLNode::createWithIterators(arr, arr + sizeof(arr) / sizeof(int));</pre>	5, 5, 11, 8, 7, 10, 4, 12, 2, 11, 2, 12, 9, 12, 9, 8, 16, 15, 2, 4, 9, 8, 17, 6, 12, 16, 13, 14, 6, 8, 12, 15, 9, 10,	5, 5, 11, 8, 7, 10, 4, 12, 2, 11, 2, 12, 9, 12, 9, 8, 16, 15, 2, 4, 9, 8, 17, 6, 12, 16, 13, 14, 6, 8, 12, 15, 9, 10,	
	<pre>LLNode::printList(head); cout << "\n"; LLNode* newhead = foldLinkedList(head); LLNode::printList(newhead);</pre>	11, 8, 15, 5, 11, 7, 7, 9, 16, 12, 8, 6, 14, 7, 11, 5, 18, 11, 2, 6, 13, 8, 11, 4, 7, 10, 7, 5, 3, 12, 13, 9, 14, 8, 9,	11, 8, 15, 5, 11, 7, 7, 9, 16, 12, 8, 6, 14, 7, 11, 5, 18, 11, 2, 6, 13, 8, 11, 4, 7, 10, 7, 5, 3, 12, 13, 9, 14, 8, 9,	
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· H	4, 11, 6, 16, 11, 1, 15, 11,	4, 11, 6, 16, 11, 1, 15, 11,
HK.	11, 17, 3, 10, 14, 11, 6, 9, 11, 5, 16, 5, 3, 13, 4, 6, 12,	11, 17, 3, 10, 14, 11, 6, 9, 11, 5, 16, 5, 3, 13, 4, 6, 12,
OF CHIKH	5, 4, 1, 5, 10, 7, 18, 2, 8,	5, 4, 1, 5, 10, 7, 18, 2, 8,
T.	12, 8, 13, 13, 4, 5, 9, 7, 15,	12, 8, 13, 13, 4, 5, 9, 7, 15,
20 0	8, 11, 12, 9, 14, 12, 9, 8,	8, 11, 12, 9, 14, 12, 9, 8,
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	8, 11, 9, 11, 15, 4, 7, 17, 7,	8, 11, 9, 11, 15, 4, 7, 17, 7,
	5, 6, 10, 9, 6, 8, 7, 6, 8, 5,	5, 6, 10, 9, 6, 8, 7, 6, 8, 5,
` `	16, 12, 3, 10, 13, 15, 10, 9, 9, 15, 10, 5, 7, 13, 9, 11,	16, 12, 3, 10, 13, 15, 10, 9, 9, 15, 10, 5, 7, 13, 9, 11,
TÀI LIÊ	12, 5, 15, 8, 2, 17, 3, 6, 6,	12, 5, 15, 8, 2, 17, 3, 6, 6,
•	8, 16, 13, 11, 9, 11, 3, 3, 2,	8, 16, 13, 11, 9, 11, 3, 3, 2,
BOIH	5, 8, 9, 12, 11, 7, 13, 10, 10, 2, 0, 16, 10, 8, 17, 4, 0,	5, 8, 9, 12, 11, 7, 13, 10, 10, 2, 0, 16, 10, 8, 17, 4, 0,
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	12, 3, 13, 8, 16, 7, 12, 9,	12, 3, 13, 8, 16, 7, 12, 9,
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BACH	KHOACNCP.COM	10, 1, 3, 11, 10, 0, 0, 3, 3,

Test	Expected	Got
	13, 10, 15, 9, 11, 12, 2, 12,	13, 10, 15, 9, 11, 12, 2, 12,
	7, 7, 11, 13, 13, 10, 14, 11,	7, 7, 11, 13, 13, 10, 14, 11,
	10, 14, 8, 10, 15, 4, 9, 7,	10, 14, 8, 10, 15, 4, 9, 7,
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	4, 2, 6, 11, 5, 14, 6, 5, 14,	4, 2, 6, 11, 5, 14, 6, 5, 14,
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	6, 12]	6, 12]



	Test	Expected	Got	
•	int arr[] = {6, 5, 8, 2, 3, 1, 3, 7, 7, 9, 0, 4, 4,	[6, 5, 8, 2, 3, 1, 3, 7, 7, 9,	[6, 5, 8, 2, 3, 1, 3, 7, 7, 9,	~
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Test	Expected	Got
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	Test	Expected	Got
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Điểm cho bài nộp này: 1,00/1,00.

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